The Builder.

No. CLX.

SATURDAY, FEBRUARY 28, 1846.

AN old friend of ours, when he hears the expression "measure and value," usually exclaims, "Measure and robbery;" and those persons who are acquainted with the subject, and can look at it dispassionately, know that unfortunately, there is ground for the remark. Tradesmen who are working one for another, with the understanding that the work done by each is to be measured and valued, in order to strike the balance, have a coarse but expressive term, which shews their own notion of the system: they call it *blood-work*, and would never think for a moment, under other circumstances, of allowing a builder, to whom they were to pay money, to make out his charge by measure and value. Amongst the community generally, this same feeling extends; and the consequence is, that men will hardly build a pig-stye, or paint two or three doors or windows, without a previous contract on the part of the workman. What should be the most just and proper mode of arriving at an equitable settlement has fallen into disuse, and many builders of the present day have paid severely for undue advantages enjoyed by their predecessors.

It is truly surprising, that so intelligent and powerful a body as the builders are, should allow this state of things to exist. It appears to have been caused by a refinement in the description of details introduced by the early measurers, and the consequent multiplication of items which, when all priced singly, at sums not above the worth of each article or process considered separately, amount in the gross to much more than the real value of the whole work done.

A writer in the first number of "Loudon's Architectural Magazine" (March, 1834), in an article "On the present state of the professions of architect and surveyor," referring to the objections made by employers to admit surveyors to measure works, says:—"Nor can any one be surprised at it, when we witness the extortionate charges made by some surveyors, whom I shall here style *custom* surveyors. This is the manner in which they proceed: two surveyors meet to make out an account of certain works done. We will suppose the account which they have to settle is a plumber's bill. The first article is 18 cwt. of milled lead; the plumber's surveyor requires 25s. per cwt.; the surveyor for the opposite party remonstrates, and points out to him that the prime cost was 15s.; the other replies, that 25s. is the customary price, and that he cannot take less. To convince his opponent, he opens an old measuring-book, and shews that 25s. has been charged in an account that he settled on behalf of Mr. Getall with Mr. Easy, the surveyor, some years before; and he again repeats, that it is the *custom* to charge 25s., and that he cannot deviate from it. In the same way, he charges 1s. per foot for pipe that only costs 4d., and 1s. per foot for solder that only costs 5d.; and so he goes on in the same ratio with all other articles in the bill. After charging so extortionately for all time and materials for making a joint to a pipe, he has the conscience to ask, in addition, 2s. 6d. for that joint, though he cannot tell why he does so, except that it is the *custom*, &c. The consequence of all this is, that the surveyor of the opposite party, if he has any conscience, cannot settle the account, and it is referred to the lawyers." The fault rested more with the system than the men. The result could have been anticipated.

In any alteration of the system that might be attempted, it would not be sufficient to deal with the *prices* to be allowed; reference must be made to the mode of measuring. The prices set forth in the various books annually published on the subject, have been carefully calculated, and for work *done in the best manner*, on ordinary credit, as given by respectable houses to their regular customers, are probably no more in most cases, than will return the tradesman a fair profit for the capital and skill employed.

Unluckily, however, surveyors consider themselves bound to claim for their employers (when there is no agreement), the same prices in all cases alike, without reference to the manner in which the work is executed; and conscientious men are often pained, when called in to "measure and value" work, at being obliged to put a sum for it—say 20 per cent.—higher than that for which they know perfectly well the tradesman, their employer, would gladly undertake a precisely similar job.

Look at the difference in work as executed by different parties. Why, a pair of folding-doors we saw this morning *cost* the maker five and twenty per cent. more than doors of the same size we saw yesterday; and yet if these were to be measured and valued, an asserted custom would force the surveyor to put the same price to the indifferent work as to the very good. In painting and plastering, even a greater difference may constantly be found. The proper *preparation* of work for painting forms an important item in the calculation of prices; and this in execution, in many, many instances, is not attended to at all. If able and upright surveyors would become *really* valuers; if throwing aside in a degree the trammels of a custom which has nearly destroyed itself, they would price the works submitted to them according to their proper value, considering the special circumstances of each case, the actual cost, and the skill exhibited, they would soon gain the confidence of the public, and induce an equitable mode of dealing and great improvement in our operatives.

We approach this subject not without hesitation: we are satisfied that the present system is as injurious to builders as it is unsatisfactory to the public, and we sincerely desire to aid in effecting some salutary alteration.

KENSINGTON PARISH AND THE BUILDINGS ACT.

ON Monday, the 23rd inst., a vestry meeting was held at St. Mary Abbot's, Kensington, to consider what steps should be taken to obtain a repeal or satisfactory revision of the Metropolitan Buildings Act. The churchwarden, Mr. Bellworthy in the chair.

MR. HAWKES briefly introduced the matter to the vestry; he condemned the Act as a piece of arbitrary tyranny; it was objectionable not merely as a tax on the parishioners for unnecessary services, but on account of its continued interference with private rights and comforts; and he called urgently on the parish to exert themselves to obtain its total repeal, or at all events, such a modification of it as might render it less objectionable.

MR. GUNTER addressed the vestry at some length, and gave a humourous account of the difficulties he had found in making a few trifling repairs to farm buildings on his estate, and of the half-guinea fees consequent thereon. In his own residence, where he was making alterations, he wished to enlarge a room by removing a chimney-breast, but the Act said he shouldn't, and for a long time his views were delayed in consequence, though ultimately he effected what was wished. He thought the Act one of the greatest innovations of modern times, and would do all he could to obtain its repeal. Nor could he sit down without making one personal observation, which was, that he thought the clerk of their district surveyor had no business to enter a building without first knocking at the door: if he persisted in doing so, he ought at least to wear some badge, or he might one day be taken for something less honest and treated as such.

MR. STEPHEN BIRD said he had been in Kensington more than forty years, and never knew of a single accident through want of sufficient walls or other bad construction. The houses were all built safely, there had never been a failure, and the Act he thought not wanted there. Many of the provisions were most absurd. The clause which called for 2 feet of brickwork round a chimney-pot if above 4 feet high, and a fee of 10s. 6d. to the surveyor, was one of these, and would force people to put up with smoky chimnies. A pot 4 feet high could be fixed quite safely without the brickwork or the surveyor. No builder was safe in commencing: to understand the Act in parts was impossible: it was a tax on the parish, and a great abomination.

MR. E. NIXON (of Bladon Lodge), was disposed to think the Act altogether objectionable, and that no revision would be so satisfactory as a repeal. Its interference with trifles was most objectionable, and he referred to a "rabbit-hutch" case which had come within his own knowledge. Worse, however, than this, an Englishman's house was no longer his castle. The comfort of a friend's daughter in Kensington, who was seriously ill, had been greatly interfered with by the conduct of the district surveyor's clerk, in respect of a tin tube hastily put up to prevent the chamber chimney from smoking. A petition should be immediately addressed to Parliament.

MR. RYMILL said, a friend, who had recently raised his chimney four courses of bricks, had been called on for 10s. 6d.

MR. GODWIN said he thought it desirable to mention, although many there were probably aware of it, that a speedy revision of the Act was contemplated by the proper parties. That Kensington would be exempted from its controul was not at all likely; the better course for the parish would be, to point out what they considered objectionable to the Commissioners of Woods and Works, either through the official referees or otherwise, and there was no doubt due attention would be paid to these objections. There was much that was good in the Act, and repeal could not be anticipated. The great point to be obtained was the protection of the public with as little interference with private rights as possible.*

MR. HANSOM could not see any one good part in the Act. Mr. BIRD said he was of the same opinion; it militated against ventilation, for you could not open a window without a fee; it increased the rent of a small house a pound per annum, and it interfered greatly to prevent the exercise of ingenuity.

MR. HAWKES, in closing the discussion, objected to the strictly legal form given to all the proceedings at the referees' office, and the difficulty of obtaining information. The meeting then agreed, that a petition for the total and immediate repeal of the Act, as inquisitorial and unsatisfactory, should be drawn up and presented forthwith. And a committee was appointed to carry out this resolution, and further, to communicate with the Commissioners of Woods and Works.

The vestry then proceeded to discuss the injurious tendency of the window-tax, and resolved to present a petition for its immediate repeal.

* On Wednesday night, in the House of Commons, Mr. Forster asked if it was the intention of Government to bring in any measure this session to amend the Metropolitan Buildings Act, against which there had been so many complaints?—Sir J. Graham said it was the intention of Government to bring in a Bill to amend that part of the Act by which persons who were referees under it, were prevented from following their own profession as surveyors. There would be thenceforth three referees, two of whom would receive only 50*l.* a-year, because they would be allowed their private practice. He did hope that another Bill with more comprehensive amendments would be brought in in the course of the session.

PROFESSOR COCKERELL'S LECTURES ON ARCHITECTURE.

In the sixth and concluding lecture on architecture delivered at the Royal Academy on Thursday, the 12th inst., Mr. Cockerell entered into some comparison of the classical and medieval styles, and commented upon the imitative system of the present day. He urged the importance of studying the system of each style, in order to treat them effectively, and concluded with some general advice to the students on the principles of composition, and suggestions for the attainment of a distinct and national style.—He said, that he had now laid before them some outline of the various systems or schools of art; these studies they were themselves to carry much further than could be done in a short course of lectures. Originality would arise from the light, in which each individual would view the same subject. There were two errors, which must be carefully eschewed; the excessive love of novelty and originality, and of displaying originality, and on the other side, the exclusive desire for imitation. The first pernicious tendency had existed in Germany during the middle ages, and had been noticed by Albert Durer. We found spires twisted, curved, and pierced, and every caprice in plan and arrangement. In the present day, we were wholly imitative, till at last we were becoming sick of reproduction. He said, that with this desire, we were apt to become partisans, and to believe that we really belonged to the times, in which the particular styles prevailed. Amongst the young especially, these erroneous notions were entertained. True, we did not, like the Germans, stalk about in long beards and caps, or as the French, adopt the Roman toga, and the costume of Francis I., but we had equal eccentricities, such as they were, amongst a people not very much gifted with the love of art. We should therefore endeavour to find what were the real sources of art.—He said, that art was the visible portraiture of the mind from which it emanated, the growth of the times and people from whom it sprang. We must confess, that it was amongst the Greeks, that art was best practised and understood. We found a practical use of the laws of optics in Grecian architecture, which no other system could exhibit. He then alluded to the *scamilli impares* of Vitruvius, the explanation of which had only lately been gained. It had been a tradition amongst barn builders, that unless the line of roof were *hog-backed*, it would appear to bend in the middle. Mr. Penrose had lately found, that the outline of the entasis, in the columns of the Parthenon, was the hyperbolic curve, and no other. In such merits the Gothic style was inferior. In construction, the principle of simple repose, perhaps rendered necessary from the frequency of earthquakes, was the only one followed, that of equipoise was not attempted. The Romans could appreciate the Grecian principles, and, though not equalling their teachers, did something that was still respectable. By the aid of the arch, they produced the magnificent ephebeum of the baths, which the architects of the middle ages knew not how to imitate. The ephebeum of the baths of Caracalla was wider than Westminster Abbey, and Westminster Hall would stand within the basilica of Trajan. These enormous vaults were of solid construction, and therefore there was no relying upon fire-offices and insurance. The professor here exhibited a view of the great ephebeum of Caracalla, restored. Did we turn to the architecture of the middle ages, he continued, we found no conic sections, and none of those refinements, which marked the smallest production of the Grecian chisel. In this comparison, we must be content to be losers.

The professor next alluded to the influence of climate and material, and to the trabeated and arcuated systems. He said, that these two systems should not be mixed together, and that we were apt to carry the trabeated arrangement into our churches, for which it was not adapted. The system of classical architecture turned upon the employment of the largest scantling, whilst that of the middle ages worked with such stuff as a man may carry on his back; what one effected by extension, the other produced by spiring up; in the one the main lines were horizontal, in the other vertical; the forms of one were designed to give shade, of the other to resist wet, and rather to tell by the outline on the sky than in the eternal glitter of sunlight. In classical architecture the doors were of large size, the upper portion often serving for a window to light the edifice, in Gothic architecture they were purposely small. The windows, on the contrary, in classical architecture were small, and of minor importance, whilst in Gothic architecture, they were large and elaborately embellished.—He then said, that after the objections he had made to imitation, he might be asked to recommend a style, and therefore in church architecture he would offer some suggestions. These he could better express in the form of a parable. In this form the monk Colonna had composed his celebrated book, which had become a magazine of art, so much so that designs were carried out from the description.—In what followed, Mr. Cockerell pointed to a plan of a proposed cathedral, with accompanying buildings. Except in the circumstance of their being a spacious chancel, the principal building was in few respects similar to any existing cathedral, ancient or modern. The plan of that part intended for the congregation, was somewhat peculiar, being polygonal in its general outline, but broken by circular projections. Internally, the arrangement was octagonal. A chapter-house occupied the usual position of the lady chapel, and at the opposite end of the church was a large vestibule. These distinct portions were arranged in line, the main front being approached through a cloistered court. This plan, Mr. Cockerell said, he considered as a venture, and he had not attempted to draw out any elevation.

The professor commenced his relation by saying, that he conceived himself standing with a bird's eye view of a great city. Amongst the various buildings, one at once arrested his attention—it was the high church, built in the pointed style of architecture. To it were attached various buildings, the lines of which resolved themselves into great uniformity and symmetry, as though the whole had first appeared to be a confusion, and then resolved itself into a distinct symmetrical plan. The church was covered by a lofty dome, and by a smaller dome; there were also two towers, making in all four terminations. These passed each other, and were grouped in various positions, as they were approached in the windings of the road; he was reminded of the spires of Lichfield, as seen in driving round the city. The smaller dome gave a wonderful magnitude to the larger dome. The vertical lines, contrasted with the curved forms, and, together with the court-yard and the adjoining buildings, the whole shewed "a mighty maze, but not without a plan." The towers, similar in their construction, sometimes looked all solid, and sometimes perforated; they were like Antwerp, but were not bird-cages; the effect was that of the west towers of St. Paul's Cathedral. On a nearer approach he discovered, that the details were not Grecian, but of that cultivated Gothic, which the later ages permitted. The domes terminated in the ogee form, and rose from a base, round which there were projecting buttresses. In this dome, the eternal square and angle, which were the great reproach of medieval architecture, were avoided. The small dome looked like a younger dome:—he was reminded of the Church of Sta. Maria della Salute, at Venice. He was also reminded of St. Mary's, at Oxford, there being buttresses and pinnacles clustering round, which seemed to give honour to one larger termination, that grew out of them. The covering was of tiles, in patterns—recalling the domes of Kairo; but although the ogee form was there, there was nothing Oriental. Such tiles had been used for roof coverings in Germany.

On nearing the west end, he found that it was approached by flights of steps, and through a quadrangular cloistered court; so that by going round, the church might be reached under cover. The cloisters communicated with schools, parochial offices, and other buildings. In these, the depressed or four-centred arch was always employed in depressed positions, as under floors, and the acute arch above, according to the principle of William of Wykeham. In the quadrangle, he noticed the admirable proportion of the plan to give effect to the west front. As Cæsarianus had recommended, the point of view was taken at 3½ times the height of the building. The western doors had three vast arches, similar to those of Amiens Cathedral. Around the principle door were grouped the twelve apostles, rather larger than life, in ample niches, not elbowed, as usual in Gothic buildings, where you wondered how they got in, or how they could get out again, but allowing of the beautiful play of light and shade, which a larger niche admitted of. The doorway had the central pillar, against which was a figure of the Saviour. On the soffit of the arch was carved the root of Jesse. The doors, themselves of bronze, were covered with foliage, and subjects illustrative of the ten commandments; much importance being given to the ninth commandment. The figures of the apostles were so arranged in reference to other adjuncts, that a scale was given to them, as in the case of the sculptures of the Parthenon by the metopes. These figures, not being colossal, that modern mistake was avoided, which sees no other way of representing a great man than by making the man great. In their expression, he was struck by their sincerity and truth; they seemed, as if he had seen them before. There was great variety, and the character of each apostle was given. They were not dressed, as Bernini would have represented them, in draperies of silk, neither were they tattered like beggars, but in all respects their dresses were such as would be worn by labourers worthy of their hire. Near the same place were the patriarchs, the martyrs, Paul and Stephen, and the great reformers, as Luther and Melancthon. We might also observe the parable of the wise and foolish virgins, but no saint or miracle was represented in any part of the building.

On entering the church, he at once saw that it was a Protestant building, and not intended for processions. The first compartment was a vestibule, with pillars on each side. It was lighted by large windows, filled with stained glass, and was decorated in polychromy, the colours, in each case, being so selected as to harmonize with each other. The pillars were long and delicate, and at first there was some fear that they were not secure, but when it was discovered that they were bronze, the mind became reconciled. These pillars had capitals and bases of great projection. In the middle of the vestibule was a font, railed round. In the stained glass there was no quaint drawing, but the figures reminded him of those by Bassano and Titian, and he thought he could there discern the work of some, whom he would forbear to mention. The faults of the old stained glass were avoided; the light was not intercepted, the dark parts were not produced by black shades; the system resembled that in the windows at Munich, and was quite different to that of Sir Joshua Reynolds in the window at Oxford. The subjects represented included the sacraments, the baptism of John, with many moral subjects never before portrayed. This vestibule was used at burials, and for church meetings. The organ was placed at the west end. At right angles, between this vestibule and the church, there were galleries of access for valetudinarians.—On entering the church, he found that it was of large dimensions. It had a spacious chancel, the ceiling of the chapter-house being seen beyond the altar, somewhat after the manner of the Church of St. Giorgio, at Venice, by Palladio. The arrangement was that of the auditorium, required for Protestant uses, and to accommodate so large a congregation, galleries had been found indispensable. The floor of the church was lowered like the pit of a theatre, or as some of the better kind of meeting-houses. The communion-table was long, and fit for twelve, and behind it was an enriched screen. The great objection to many modern churches, arising from the size of the western gallery, was obviated, the architect having thrown up the centre portion for a singing gallery; thus there was an uninterrupted view of the church. The pulpit was attached to one of the piers. The ceiling was coved, and terminated in a ring of stone, near which were the heavenly choir, and groups of cherubim. At the top was a golden Triune. There were other star-like openings in this ceiling, through which light was admitted. Some of the galleries had latticed work, so that those, who went to church for other purposes than to show off new bonnets, could be free from observation. There was another gallery of stone similar to a triforium.—The general character of this building was English and Christian; yet it had not the square and angular outlines of the Gothic. It was evidently the work of no or-

dinary mind, and it was impossible to discover in any of the details, by what system they had been coined. There were to be seen columns of polished granite, English marbles, slabs arranged in the manner of the Roman mosaics, and glass columns and rays. These last were hollow, an iron tube, gilt, being passed through them, and had a very splendid appearance. The basin of the font was of glass, and there were glass points on the pinnacles.

The building had a fine outline, as if the architect had made many studies of it, or as if he had viewed it in a fog. The details had been well considered, and nothing had been done, either in whole or in part, without a model. The system of principles and subordinates had been attended to; there was a dome, and subordinate dome; enrichment, and subordinate enrichment; profile, and subordinate profile. This was the principle in the Propylæa, in the scrolls of Raffaelle's frescos, and in the columns of Palladio's town-house at Vicenza. The architect had deeply studied the purpose of the building, and the nature of the materials. He had carefully attended to the principles of co-mensuration, and of "proportion and proportionality." Indeed, he had thrown over the pedants altogether, so that he was ridiculed in his day, though foreign artists applauded, and trade flourished through his exertions.

Thus, Mr. Cockerell said, he had traced the birth and progress of medieval architecture, on which he had thrown some fresh lights, really new to himself, and had shewn how it was possible to produce new combinations. He recommended them to do the same, for it was, in fact, their business to agitate this subject of architecture, to the study of which they should direct all their energies. In concluding his course of lectures, he sought no reward but their gratitude, because, in the words of an author he had often quoted, we lived for others, and not for ourselves.*

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RAILWAYS THROUGH THE SEA.

"Let down your rails, ye nations, near and far;
Yoke your full trains to Steam's triumphal car;
Link town to town; and in these iron bands
Unite the estranged and oft embattled lands."
CHARLES MACKAY.

RESPECTED FRIEND, — The practicability of constructing submarine railways having been pronounced by several scientific individuals, I am induced to crave thy permission to address a few remarks on the subject to the community at large by the medium of thy columns. Being aware that it is only gradually that the human mind can receive any thing greatly foreign to its experience, I presume that I may be excused for attempting to explain that many obstacles which might be supposed to exist against carrying out the plan, may not be of an unsurmountable nature, but such is the power of habit, that although this may be termed the age of inventions, and that in which science guides the car of human affairs, and although man looks with an eye of pity on past ages, he is continually inclined to look with scepticism on things which are proposed to facilitate the development of commerce and civilization, as though science had exhausted her store, and that the time would come when man could no more invent; yet it is probable that the efforts of future ages will prove, that he is now only on the threshold of her temple, and that what man has now in his possession is but as a grain of sand on the sea-shore. Future ages will probably look on the present age as the period when man began to reap the advantages of science, and led the way for infinitely greater results than those which his generation could witness. Science is probably one of the instruments destined to remove many evils which short-sighted man has long considered as inevitable; already she besieges the strongholds of ignorance and superstition. She opens the roads between distant countries by her "handmaid steam,"

"And breaks the barriers that since earth began
Have made mankind a foreigner to man."

But while the rails are laid in almost every country in Europe, while all the important towns of England are connected by these "iron bands," Britain is isolated from the rest of Europe,—twenty miles of sea remain as nature's barrier to universal communication. The traveller from the north reaches Dover, but the train can take him no farther; he retraces his steps, those twenty miles of sea appear to him infinitely more than 100 miles of railway, so that he looks on the continent as a spot which he cannot tread. This may be proved by referring to the small number of persons who cross the channel, compared to the crowds of travellers in the railway trains. May we not then ask the question, can a railway be made from Dover to Calais? Had the question been asked fifty years since, the answer might have been in the shape of a threat to lodge the querist in a lunatic asylum, but in these days of gigantic enterprise the question will appear more plausible, although it will still appear formidable to every one until the subject has been minutely examined.

When an engineer is appointed to examine a country through which a railway must pass, he selects that part which is free from engineering difficulties, that is, he avoids hills and vallies, as far as he can, but when a circuitous track can be avoided, he hesitates not to direct the road to be cut through the highest mountain: now we may examine the nature of the spot between Dover and Calais. If we consult the charts, we shall find that it is a vast level plain, the soil of which though not cultivable, is neither rocky nor mountainous, but there is an obstacle which the engineer has not hitherto surmounted; this plain is covered with water, an element which is too dense for us to feel at home in it; but can it be more difficult to cut a road through the water than through a mountain composed of solid rock? There is a level plain, so that all we have to do is to throw a huge half cylinder of iron on it to prevent the water from obstructing the rails which would be placed under this iron arch, so that to cut the road through the water we have only to pump the water from the tube; when empty, the road would be open, and surely it would be easier to pump water than to cut, and blast, and dig through solid rock, and of course, when completed, the water above could no more interrupt the sub-marine navigation of this road, than the thousand tons of stone on the tunnels of almost every railway on land.

I hope that I have made the plan sufficiently intelligible; now for the details of the work. This immense tube must, of course, be built in separate divisions, perhaps of 1,000 feet in length; in that case only 104 divisions would be required to join the rails of the South Eastern Railway with those of Calais and Paris; now supposing each of these divisions would cost 40,000*l.* the cost of the whole would be 4,160,000*l.*, and if we allow for the expense of throwing them in deep water, of connecting them, of building stations, &c. on a magnificent scale, it will, I believe, be found, that the sum of 8,000,000*l.* sterling would be quite sufficient to complete this sub-marine railway. Perhaps it might be completed at a much less expense, if so, we might even in this age see sub-marine railways constructed in still wider channels; the main things we have to consider is the practicability and economy of the plan. It might be argued that the air would be impure in these buildings, but by means of pipes laid the whole length, and air-pumps worked by steam-engines, the air might be constantly renewed; then by adopting the atmospheric mode of propulsion, the air which would be exhausted from the tube would be almost sufficient to renew the air without other pipes. The building, thus buried in deep water, would be safe from the effects of the storm, and while the sea above would be boiling its waves with fury, the flying train would be rolling with the velocity of the wind, sheltered even more than on land; here wind, frost, or rain could not penetrate, so that the marine passage, instead of being the worse, would be the most agreeable part of the journey. These tunnels would, of course, be lit with gas, and in addition, every carriage might have a lamp on each side, so that each train might be as a moveable hotel.

I suppose that there are very few persons who would not wish to see England joined to the continent by railway; but many more will be inclined to doubt the practicability of the plan: we are so accustomed to question the practicability of any thing with which we are not familiar. The Thames-tunnel was at first considered a desperate undertaking, but at present no one would doubt the possibility of boring under the widest river of England: the immense expense attending the work is the main cause why we do not see the plan generally adopted. But now let us examine whether the construction of sub-marine railways can be more difficult. In boring under the bed of the water, on the latter plan, a considerable depth must be reached previous to excavating under the water; so that engines must be kept constantly at work to pump the water which rushes in torrents in the tunnel; and, in fact, the pumping must be continued until the whole length is bored, and the arch completely built; but for sub-marine railways the work is almost completed on land, so that the work under water is of a comparatively trivial nature: much less then is required to construct bridges and breakwaters. So at present, I may ask, where does the difficulty lie? Not in building the tunnel, for boiler-makers could complete that part of the work; not in sinking it below—we have only to fill it with water, and it would sink by its weight; not in connecting the divisions—this would be the work of only a few hours. Then where is the obstacle? Perhaps in the fears of the timid, that the building, being surrounded by water, would be in a dangerous position. But would it be considered more safe if surrounded by a fluid as dense as oil or tar, or as heavy as quicksilver? Is water more to be dreaded than any other fluid or substance? Yet we are not afraid of venturing in small vessels, and encountering the most violent storms. It is well known that vessels have been entirely embedded in the waves—the mast only being visible above water; and of course during that time the building is battered by the agitated sea as iron on the anvil—the sailors being tied to the rigging not to be washed overboard. I may ask of those who know something of this "pleasant travelling," which would be the safest position—the vessel floating above, and carried over the mountain waves as with the rapidity of lightning, or the tunnel snugly wedged below, where the water is more dense, and where the effects of the storm could not possibly be felt? Very little consideration may suffice to be enabled to answer the question, particularly with those who have conducted sub-marine operations, and who understand the force with which the sea, when agitated by the wind, will batter against a body within reach of its surface.

But if anything was wanted to prove the safety of a building on the bed of the sea, we might refer to the fact of many vessels having remained on the spot where they had sunk, for half a century or more, without having suffered injury beyond that which resulted by the wearing of the wood, the whole of the timbers having remained as firmly fastened together as when they had sunk below; and yet of course no precaution had been taken to prevent their receiving injury. The Royal George is an illustration of this. After having been so long in deep water, when the divers descended on board, they found a quantity of wine in glass bottles uninjured; many a storm had swept over that building since it had foundered, but they had caused no more injury to it than if it had been embedded in solid rock. Again, then, I ask, what is water, that we should dread to construct a road through it, more than if it was as dense as quicksilver, or as hard as diamond? must we be prevented from laying rails on these vast plains, where the soil belongs to no mortal, merely because they are covered with a fluid too dense for us to breathe, while we penetrate through mountains merely to save a gradient, or to shorten a road a few miles! Surely we need not suppose that obstacles can only be overcome on land, where, to construct railways, valleys must be filled up, hills cut through, viaducts and bridges built across rivers, and frequently large houses must be demolished, and parks utterly destroyed; none of these works and ravages are required for constructing sub-marine railways, the only obstacle is the sea, a body over whose serface we are not afraid of gliding, even in the most terrific storms, in a small building which may be under 20 tons burthen, and to which the bursting of a small plank would be certain destruction; the force of habit seems to lead us, unwillingly perhaps, to feel terror at the idea of finding ourselves in a position where it is not common for us to reside, however free from danger it

* Full reports of Professor Cockerell's lectures are given in this and Nos. 154, 155, 156, 157, and 158 of THE BUILDER.

may be, while the same force reconciles us to travel through the whirlwind on the ocean some thousands of miles, scarcely aware that there is any danger at all.

To those who are not aware of the facility with which submarine operations are conducted in these days, the work will appear more formidable; thus, by the usual mode of descending in diving-bells, a pipe, communicating with a pump, is required to renew the air; but Dr. Payerne has obviated this inconvenience, having discovered a chemical substance by the decomposition of which he forms air, while another substance absorbs the nitrogen or expirated air, and thus the workmen can remain any length of time below without inconvenience; this would be principally required while boring the bed of the water, for blasting it with gunpowder, as it would be essential to sink the divisions near the shore in the earth, but this operation could be conducted without difficulty. A diver told me more than ten years since, that he had worked for three successive hours in deep water in breaking up a vessel, and ascended above but twice during that time for a few minutes; he said he found himself scarcely more fatigued than if he had worked on land. Since that time considerable improvements have been made in diving-bells, and it is probable that the construction of submarine railways would be the means of suggesting further improvements, which might render the working under water a matter of almost equal facility as on land.

The iron for tunnels should be one inch thick, the plates being made as large as possible, and rivetted together as steam boilers; there should be strong ribs of iron constructed of the shape of the arch, and by placing these sufficiently close, there would be no necessity for having longitudinal ribs, as the plates would bind the whole firmly together, but as an additional security other plates might be rivetted inside; yet this would not probably be required, for if we examine a steam boiler made of iron plates half-an-inch thick, we can hardly conceive what pressure would be able to bend it. So that by using iron one inch thick, we may safely conclude that it would be impossible for it to give way; it would, in fact, be able to bear many a hammering, without receiving injury, for of course it would be infinitely stronger than an arch of brick-work; yet many of these arches have to support much greater weights than iron tunnels could have to sustain, even if a vessel, cargo and all, were to sink on the building; the chances of such an accident must of course be very distant, when we consider the vast extent of the sea, compared with the works of man.

The question which I now submit to the scientific world is,—Can wrought-iron tunnels be used as a medium of railway communication, whether they are suspended between mountains, or placed underground in parks, &c. or imbedded in the water? That many objections may be brought against the plan, I am aware, but objections have been brought against every thing new—objections which have seemed plausible in theory, but which have been found to have no existence in practice. This plan is certainly one of considerable magnitude, and of course a deep consideration is required before coming to any conclusion about it. I may remark that it was not till after having studied the matter in all its bearings, that I ventured to intrude the plan before the public, but I may be mistaken; there is however one circumstance which is perhaps in favour of the plan, it is the fact that several individuals have attempted to claim the invention as their own, and among these several eminent engineers. The name of R. Rettie, C.E. of Glasgow will be familiar with the readers of the THE BUILDER, in connection with attempts to claim the invention. I have been in fact obliged to prove, by the medium of the press, that I was the first who published a plan for constructing iron tunnels, in order to protect myself from the pretensions of many individuals who, whatever they might have projected, evidently required the invention of others,

> To give to airy nothing
> A local habitation and a *name*.

But however varied may be the opinions on the merits of the plan, I presume that there will be but one opinion as to the advantages which would result if it could be carried out. The door of the continent would be open to the mechanic and the artizan, and the different nations of Europe, instead of viewing one another with a jealous eye, would combine their efforts in civilizing the world, for I believe that it will be universally acknowledged, that the principal cause of war between different nations has been by the one being ignorant of the merits of the other. That this ignorance is already disappearing is evident, so that we may safely infer that ere long, the world will be in a different state to what it was when the highest ambition of man was to destroy his fellow man.

I remain respectfully,

JOHN DE LA HAYE.

London-road, Liverpool, 2nd mo., 7th, 1846.

ROYAL INSTITUTE OF ARCHITECTS.

ON Monday evening, the 23rd inst., Mr. Tite, vice-president, in the chair, Mr. T. C. Penrose, associate, read a paper "On the curved lines of the Parthenon," the result of recent personal examination.

Mr. Penrose gave various dimensions, which shewed that the horizontal lines, namely, those of the steps, architrave, frieze, and cornice, were slightly curved, probably to correct the appearance of depression in the middle which perfectly straight horizontal lines of any length always present to the eye. The writer proved that the sides of the shafts of the columns are also curved, and that the curve is a hyperbola, whose axis is 13·23 feet below the upper step, and focal distance twice 30·5 feet, or 61.

The chairman remarked, that the discovery of the law which regulated the *entasis* of the Greeks was exceedingly valuable. We had all learnt to introduce the entasis in forming columns, but he thought the principle should be carried further—for example, in our porticos and ceilings. The French were more careful in minute matters than we; this resulted in part from the great rapidity with which every thing was done in England. They tried the effect of their sculpture and decorations, by models placed at the height at which they were intended to be fixed; and he advised young architects to adopt the practice. He then urged the importance of adopting the decimal system of weights and measures (which had been alluded to by Mr. Penrose), and promised to bring the matter in a more formal way before the Institute.

Mr. Bellamy could not admit that it was desirable to interfere with the horizontal lines, and contended at some length that we should do wrong by rendering them curvilinear. This opinion was not hastily adopted, but was the result of considerable attention to the subject. The actual rise in the centre of the top step of the Parthenon, 101 feet long, was 2¾ inches; might not this be the effect of disruption.

Mr. Penrose said this might account for it in one building, but did not when we found, as was the case, that the same appeared in the temple of Theseus, and numerous others.

Mr. Scoles laid before the meeting some interesting remarks on the Parthenon, in continuation of the subject, and these we shall probably print entire.

Some sketches of the decorations in the *Sainte Chapelle*, at Paris, were exhibited by Mr. J. G. Crace.

Mr. Poynter, the honorary secretary, then read the minutes of the meeting of council, called to consider the designs and essays which had been submitted in competition for the medals. On "The adaptation and modification of the orders of the Greeks by the Romans and moderns," there were two essays; "On the history and manufacture of bricks," seven; and for the Soane medallion offered for the best design for a royal chapel, "with seats for five hundred persons, inclusive of the suite, attendants, and choir;—the building to be detached, and in a classic Roman, or Italian style;" three sets of drawings had been received. Neither of the essays on the "Orders" were considered by the council sufficiently important to deserve the medal.

Of the seven on bricks, the essay marked,

> "Creditur, ex medio quia res arcessit, habere
> Sudoris minimum,"

was entitled to the medal of the Institute; and a second marked "Do not degrade me by comparing me with the pyramids built of stone, which I excel as much as Jupiter excels the other gods," displayed so much ability, that they proposed presenting to the author a medal of the second order of merit.

On opening the letters accompanying the essays, the first was found to be by Mr. Thomas Worthington, of Manchester, and the second by Mr. S. J. Nichol, of 11, Argyll-place, London.

The designs, although they all displayed considerable ability, were not of that high class that the Institute had a right to expect for the Soane medallion: they selected the set marked "Pendent opera interrupta," as the best, and awarded to it a medal of the second order. The name of the author was found to be J. T. Wadmore, Upper Clapton.

It is to be regretted that a want of attention to construction was observable, as well in the selected set as in the others.

Several varieties of improved window-sashes were exhibited by the inventors, amongst them a frame and sashes made by Johnson and Pask, to exemplify Herring's method of hanging sashes, whereby they may be instantly disconnected from the frame without removing the beading. It is exceedingly simple, increases the cost but slightly, and appears to answer the purpose well.

CEMENT FOR CURING DAMP WALLS, KITCHEN FLOORS, &c.

SIR,—As a subscriber to your valuable journal from the commencement, will you oblige me by inserting the following valuable and effectual receipt for curing damp walls, and suitable for use in flooring kitchens, and other purposes where the prevention of wet is necessary. The composition has been successfully used by many persons. Boil two quarts of tar with two ounces of kitchen grease for a quarter of an hour in an iron pot; add some of this tar to a mixture of slaked lime and powdered glass which have passed through a flour sieve, and been dried completely over the fire in an iron pot, in the proportion of two parts of lime and one of glass, till the mixture becomes of the consistence of thin plaster. This cement must be used immediately after being mixed. It is not well to mix more at a time than will coat one square foot of wall, as it quickly becomes too hard for use, and continues to increase its hardness for three weeks. Great care must be taken to prevent any moisture from mixing with the cement.

For a wall which is merely damp, it will be sufficient to lay on one coating of the cement, about one-eighth of an inch thick; but should the wall be more than damp, or wet, it will be necessary to coat it a second time. Plaster made of lime, hair, and plaster of Paris, may be afterwards laid on the cement. This cement, when put in water, will suffer neither an increase nor diminution in its weight.

Should the inquirer, W. H. O., feel inclined to try this receipt, I have not the least hesitation in saying he will find it answer his purpose.

Hoping the above will prove advantageous to some readers of your most useful and widely-circulated journal, I beg to subscribe myself,

JOHN HORSMAN, jun., mason.

Pontypool, Monmouthshire.

ACCIDENTS THROUGH THE BREAKING OF CHAINS.—Two accidents have lately occurred while lifting heavy masses of stone, through the insufficiency of the chains employed. The first took place at Mr. Jackson's at Pimlico, about three weeks since, when one of the workmen was so seriously injured, that for several days his life was despaired of. The other occurred last week at the British Museum while raising a block, weighing nearly eight tons; in its fall, it crushed the hand of a mason named Keller, and nearly caused the death of three others. Both prudence and humanity alike suggest that an occasional inspection and test of chains used in lifting such enormous weights, should take place.

NEW CRIMINAL COURT ADJOINING NEWGATE.—The city authorities have determined upon erecting a third Criminal Court in the Old Bailey. Last week, at a Court of Aldermen, the subject was referred to the committee of general purposes to be carried into effect.

DISFIGUREMENT OF THE NATIONAL GALLERY.

An abominable tin smoke-pipe has recently been placed in the centre of the east end of this unlucky building, immediately over the head of the sitting figure. The *stele* that before formed the termination at the apex is made into a square stone box, probably to comply with the "Buildings Act," which requires tubes above 4 feet high to be fixed 2 feet into brick or stone-work, and from this rises the ugly pipe. It gives all the effect of one of the penny steam-boats, elevated as a sign, with Britannia at the side ruling the waves.

Surely some less objectionable remedy than this, for that disgrace to modern science, a smoky chimney, could be found? If not, the nuisance should be endured within, rather than perpetrate such an enormity as this pipe is, at the head-quarters of the Fine Arts in England.

CHEAPEN AND IMPROVE GAS.

Sir,—I consider you are conferring a great boon to the consumers of gas in drawing attention to the quality of the gas they are at present supplied with, and I trust the period is not far distant when London will be properly lighted. The companies ought to be compelled to use Cannel coal, and then by judicious management the price of gas could immediately be reduced to 5s., or even 4s. This is proved by the fact, that in Liverpool, Cannel coal only is used, which costs about 19s. per ton, from which a small quantity of coke is obtained worth 9s. per ton. The gas produced is about 9,500 cubic feet, of a highly illuminating power; the specific gravity above ·700, the price only 5s. per 1,000 cubic feet; and most likely, a still further reduction will be made.

In London "Pelaw or Pelton Main" (the best coal from Newcastle) is used, the cost of which is from 22s. to 24s. per ton. It produces a very large quantity of good coke, which is worth at the present time 22s. per chaldron. The gas obtained is about 9,000 cubic feet of very weak gas, the specific gravity being very little above ·300, and its illuminating power is less than one-half that of Cannel coal gas. The price is 7s. per 1,000 cubic feet, and if we may judge from the price of the company's shares, and the amount of their dividends, there is no prospect of a reduction.

This ought to open the eyes of the companies: it is to their interest to increase the use of gas, and this would be the case to an enormous extent if the consumers could introduce it to their private apartments. In urging this to one of the officers of a London company, he stated that the reason for not using Cannel coal gas in London was, that *the meters would not then travel so fast.* I think this should have some weight with the consumers, who ought to make the demand to be supplied with gas of a certain illuminating power. Calling upon you to continue your exertions in obtaining this great desideratum,

I am, Sir, &c.,

Feb. 16th. T. A. H.

Purifying Gas.—Mr. H. Phillips, chemist, of Clist Honiton, Devon, has obtained a patent for an improved method of purifying gas. In the purifying of gas by lime, two means are resorted to, called the wet and the dry lime processes; in some works one only of the two processes is used; in other works both processes are used consecutively, and the lime employed for each process (where both are used), is fresh lime. The object of the present invention consists in using for the wet lime process the lime which has been previously used for the dry lime process, by which considerable saving of lime will result. The gas is first passed through the wet lime purifiers: new or fresh lime in the ordinary manner is employed for the dry lime process, and afterwards this lime is used for the wet process, to be immediately mixed with water, in a vat, vessel, or other receiver, to prevent it becoming hard; which lime, by means of additional portions of water, is brought to the proper consistency for the wet lime process in the same manner as if using fresh lime for such purpose; and such mixture of lime is applied in the ordinary apparatus used for the wet lime process.

ARCHITECTS' PROPERTY IN THEIR DESIGNS.

Sir,—Simple occurrences often afford useful and instructive hints, I therefore send you the following short correspondence, that recently took place between a clergyman and an architect, to be dealt with by you as you think fair and due to all classes interested. In a passing conversation between them (for they have ever been, and probably still are, on friendly terms, as far as my informant the architect is aware), the architect received the impression, that the clergyman contemplated using a plan furnished by him, the architect, for the erection of a villa on speculation, to C., a working carpenter, whom the clergyman had employed as his builder, and on duly considering the matter, he sent the following note:—

"Rev. Sir,—I was quite unprepared to hear to-day, that you purposed using C.'s plan (viz. I suppose the one I gave him) for your intended house at ———, because I was not aware you could be ignorant that it was prepared for that special purpose only, and could be therefore at his disposal for no other than the house he is building for himself. However suitable it may be for that peculiar situation, it would be scarcely so for the unconfined spot on which you propose to build; consequently, if followed in your case, while there will be sufficient in its external appearance to induce a belief that I was consulted, its unsuitableness to the spot may prove injurious to my reputation as an architect. I can have not the least objection to your employing any architect you wish, or even none at all; but you must plainly see that I have good reason to object to my designs being used for any other purpose than that for which they were expressly intended; I trust, therefore, you will do me the justice to obviate the objection in any way most convenient to yourself, and for which I shall feel extremely obliged.—I am, Rev. Sir, yours, &c.

———."

To this the clergyman thus replied:—

"Sir,—I consider myself at liberty to copy the design of any house that pleases my taste. Yet you may be at ease on the subject of your note, since I have not copied yours, nor indeed any one's, but C. is building on plans he has prepared under my direction.—I am, Sir, &c.

———."

Some might have thought proper to reply to this last, but the architect thought otherwise, and so there it ended.—I am, Sir, &c.

Feb. 16th. A. 45.

THE BEST SIZED PIPE TO THROW WATER.

Sir,—I beg leave to transmit for insertion (if you think fit) in your valuable journal, the result of some experiments made by Mr. Brunel at Bath, when employed by the Duke of Devonshire in making some improvements in the fountains at Chatsworth. The experiments were tried for the purpose of ascertaining what sized pipe would give a jet of the greatest altitude. The screw-pipe was attached to the main that comes from the castle reservoir. By the annexed it is demonstrated that a bore ⅞ of an inch in diameter throws the water the highest.

This may be interesting to persons concerned in the operation of fire engines.

I am, Sir, yours, &c.,

An Original Subscriber.

Kensington Gore, Feb. 19th, 1846.

With a pressure of 175 feet of water, the jet rose to the under-stated heights through a hand pipe, with a nozzle of varied sizes:—

Diameter of pipe in inches.	Height of jet.
½	65 feet 5 inches
⅝	91 „ 2 „
⅞	105 „ 6 „
1	92 „ 0 „
1½	94 „ 0 „
1¼	89 „ 0 „

The Wesleyan College School at Batts, near Bridgewater, is fast approaching completion. Bath and Knapp stone is used in the structure.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

Feb. 18. The treasurer in the chair.—A report was read from Mr. Lower, who is still indefatigably engaged in watching the excavations on the site of Lewes Priory, in which he mentioned the discovery of a marble effigy of a crusader of the thirteenth century, similar to that of Lord De Ros in the Temple Church. It is much mutilated; the head and legs are wanting; the right hand rests upon the breast, while in the left are held a sword and shield; the body is clothed in ring mail, and the legs have evidently been crossed. A leaden seal of Clement VI. was also found.

Mr. John Newman, F.S.A., exhibited an urn of uncommon form, and curiously ornamented, discovered in excavating for the foundations of the new Houses of Parliament. It is of late Roman workmanship.

Mr. Wright read a letter from Mr. J. W. Hugall, of Cheltenham, accompanying drawings of a very elegant leaden font of the twelfth century, ornamented with figures and scroll-work, preserved in a church in Gloucestershire. The beauty of the font is almost concealed by a thick coating of blue and yellow paint; and Mr. Hugall expressed a wish for information on the best manner of clearing away the paint without danger of injuring the font. Mr. Smith said that Mr. Hugall's object would be most effectually obtained by a solution of quicklime and pearlash. Mr. Isaacson remarked that it was a common thing to find beautiful fonts in country churches entirely covered with paint. He instanced the church of Ewell in Surrey, where, some time ago, the churchwarden, who happened to be a market-gardener, had ordered an elegant stone font of the time of Edward III. to be painted green.

Mr. Artis, F.S.A., laid on the table an elegant bronze casket, ornamented with the Vitruvian scroll and other devices; he stated it did not appear to have been cast, as the marks of the tooling were very evident; also a bronze sceptre, 21 inches in length: both these were found at Castor, Northamptonshire, the ancient Durobrivæ.

Mr. Gomonde, of Cheltenham, forwarded drawings of some Saxon remains found in a tumulus near Gloucester, mixed with which were some Samian ware and Roman coins, also a bronze figure of *Bona Dea;* some discussion ensued upon the presence of Roman and Saxon indicia in the same barrow, several instances of which were adduced.

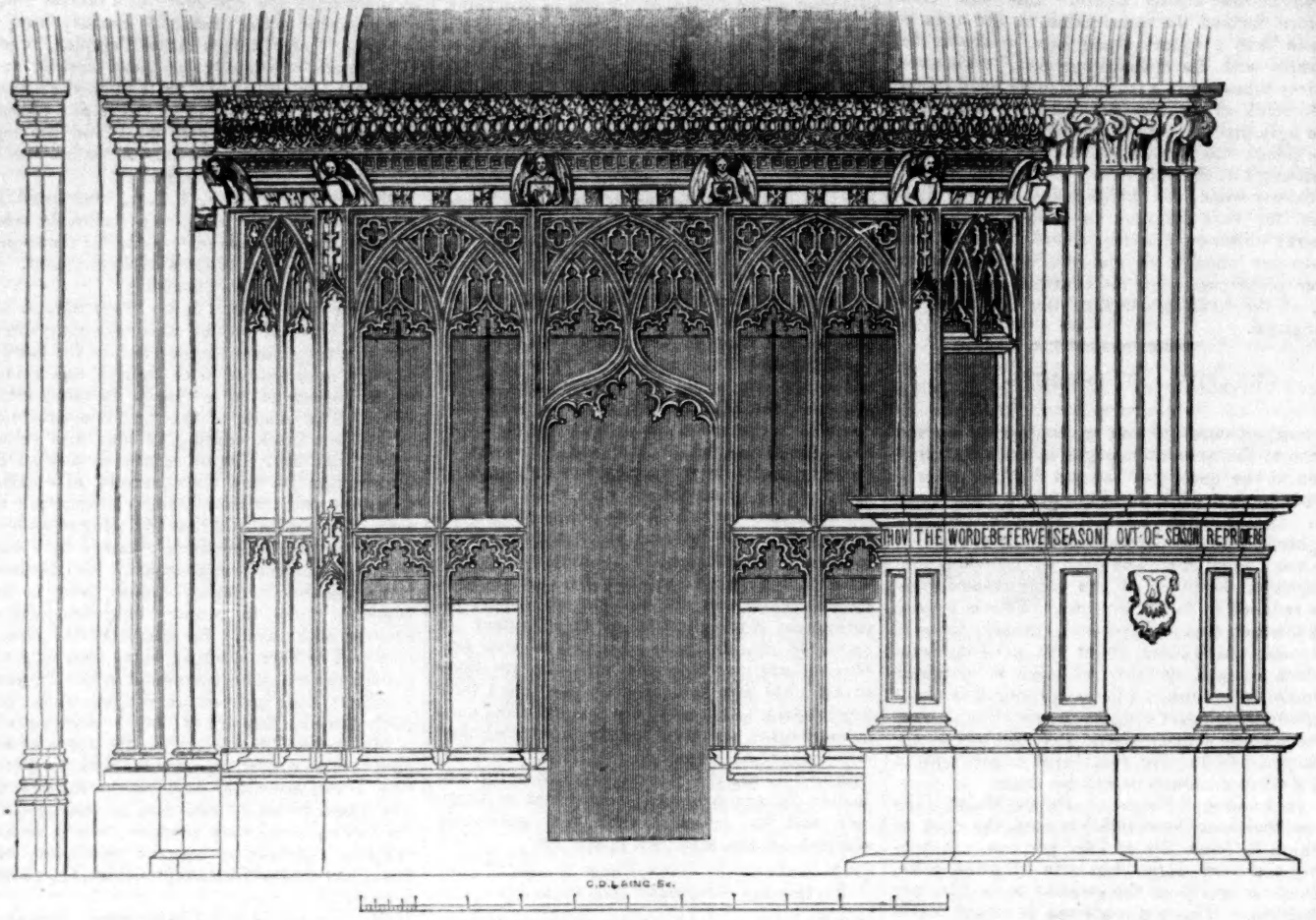
Mr. Chaffers, Jun., communicated some observations, accompanied by extracts from a letter from Mr. Wake Smart, on a very remarkable barrow lately opened at Badbury, in Dorsetshire; it was entirely surrounded by a low wall of unhewn masses of stone rudely constructed.

Letters were received from Messrs. Warne and Barnes requesting the intercession of the Association with the railway proprietors, to prevent the spoliation of the Roman amphitheatre, near Dorchester, in Dorsetshire, the line of which was to run directly through the centre, while by the deviation of a few feet, this interesting monument of antiquity might be spared. It was stated that they were there getting up a petition to the railway directors for its preservation. Mr. Sydenham made some observations on this monument, which he characterised as a "unique relic," and to the remarkable character of which, he said, attention was first called by Sir Christopher Wren, who saw it on his way to Portland to obtain stone for the building of St. Paul's Cathedral. As the property belonged to the Crown, as parcel of the possessions of the duchy of Cornwall, he thought that the Government might easily be prevailed upon to interfere and save it. This threatened case of destruction of ancient monuments led to a discussion, in which many members took part, and ended in a strong recommendation to the committee to take the most efficient steps in its power for its preservation.

Other communications were read, but our limits force us to confine ourselves, in noticing the meetings of either the Association or the Institute, to those matters which relate more immediately to architectural antiquities.

The chairman stated that the general yearly meeting of the Association would take place on Wednesday, the 4th of March. The Rev. J. J. Ellis, F.S.A., and Dr. Copland, are appointed auditors of the accounts.

SUGAR'S CHANTRY.—WELLS CATHEDRAL.



SUGAR'S CHANTRY, WELLS CATHEDRAL.

On the north and south sides of the nave in Wells Cathedral, under the second arches from the transept, are two of those remarkable structures formerly erected and endowed for the purpose of prayer for the soul of the departed. These chantry chapels were essentially distinct edifices, and are to be found in many of our cathedrals, being generally of much later date than the building, in which they are inclosed. The chapel on the north side of the nave at Wells was erected by Bishop Bubwith, who was interred there in 1424. It is an elegant structure, richly decorated.

The chapel immediately opposite to this, of which we now give a beautiful illustration, is by some called Bishop Beckington's, and by others Bishop Knight's, but inaccurately as to both; for Bishop Godwin "expressly states, that it was erected by Hugh Sugar, LL.D., treasurer of Wells (who was one of Beckington's executors), entirely of freestone, in place of a chapel of wood that previously stood there.* This, like Bubwith's, is a sexangular structure, and not dissimilar in its general design; but the tracery of the upper division is more elaborate, and the frieze and crowning ornaments more richly sculptured: the east end, or altar part of the interior, is likewise far more sumptuously profuse in its sculptural decorations than that chapel. Attached to the frieze, both on the north and south, are six demi-angels bearing shields, charged, among other bearings, with the symbols of the five wounds; a cypher or monogram of the builder's initials, viz. H. S., his arms viz., three sugar loaves, surmounted by a doctor's cap! The same cypher and arms are repeated on shields, within quatrefoils and circles, under the canopy in the interior. The eastern façade, above where the altar stood, displays a most elegant series of five niches, separated by clustered buttresses, and crowned by highly enriched turretted canopies, the soffits of which are elegantly groined in divers forms; the pedestals, which are wrought in a corresponding manner, are adorned with foliage. All the eastern part from the doorways is surmounted by a most splendid canopy or vault of stone, overspread with fan-like tracery, a rich central pendant, quatrefoils in circles, and a profusion of other forms and ornaments.

"Adjoining to the above chapel, against the great column, on the western side, is a *Stone Pulpit*, erected in Henry the Eighth's reign by Bishop Knight, who died in 1547; and which, says Godwin, 'hee caused to be built for his tombe.' It consists of a basement, and a superstructure, fronted with pilasters, panelled, surmounted by an entablature; on the frieze of which is the following inscription in Roman Capitals: — PREACHE THOU THE WORDE. BE FERVENT IN SEASON AND OVT OF SEASON. REPROVE, REBVKE, EXHORT, IN ALL LONGE SUFFERYNG & DOCTRYNE. 2 TIMO. In front are the Bishop's arms."* Our engraving shews the principal front of the monument, with the pulpit attached. We shall next week give the plan and section, so as to illustrate completely this elegant little structure.

* "Hugo Sugar, &c. 'legum Doctor, qui Capellam elegantem ex polito lapide suis sumptibus construxit, magno pulpito contiguam, ubi loci lignea jam olim fuerat posita.' 'De Præsulibus,' p. 381. The great pulpit here mentioned was built by Bishop Knight, seventy or eighty years subsequently to the erection of the chapel."

* Britton's Wells Cathedral.

CONSTRUCTION OF BRIDGES.

Sir,—It is my intention in this paper to consider geometrically the principles of the arch, and to lay before the reader its construction, so that he may be enabled to form some idea of the cause of the many repeated failures that have lately occured.

The arch stones 1, 2, 3, &c., fig. 1, of a bridge, are termed the *voussoirs*. The planes *ab*, *cd*, &c., the *bed-joints*, the exterior surface of the arch is the *extrados*, and the interior surface is called the *intrados*.

Now the arch, fig. 1, may be destroyed in two ways, first it may yield from the voussoirs sliding on each other; and secondly, the voussoirs may turn round on some point or points at which the bed-joint intersects the extrados or intrados. We will proceed to shew the conditions of safety on these suppositions, which may be stated in words as follows:—

1. That in no part of the arch must the line representing the line of pressure form an angle with either of the bed-joints less than the complement of the angle of sliding, that is than the complement of the angle at which the voussoirs would begin to slide upon themselves.

2. That the line of pressure in the arch must be confined within the surfaces which bound the upper and under sides of the arch.

Let AF, BH, CI, fig. 2, &c., be a polygonal frame composed of pieces void of weight, and supported by leaning against each other at the planes AE, BF, CH, &c. Draw these planes or bed joints at right angles to the direction of the abutting pieces; that is, make AE perpendicular to BA; BF, perpendicular to CB &c. Let weights be placed at the points at which the bed-joints intersect the exterior surface of the polygonal frame. Then on the conditions which involve the stability of friction; let us first suppose the pieces would slide on each other at the bed-joints by the application of the slightest force, which of course supposed the material incapable of resistance from friction, and therefore all forces in the frame must be applied in the direction of the pieces or at right angles to the bed-joints. From *a* (1), draw the line *ab*, and erect the indefinite perpendicular *abe*, paralliel to the pieces AB, BC, CD, draw the lines *ae*, *ad*, *ac*, then will the lines, included within the triangle *aeb*, represent the forces in the frame when it is in equilibrium, that is

bc will represent	the weight	to be placed	at	I.
cd	ditto	ditto	ditto	H.
de	ditto	ditto	ditto	E.

similarly also, and in the same proportion,

ab will represent	the pressure	on DI	to which it is	perpendicular.
ac	ditto	ditto	CH	ditto.
ad	ditto	ditto	BF	ditto.
ae	ditto	ditto	AE	ditto.

The same observation will apply to the other half of the polygonal frame, and if the whole

ILLUSTRATION OF THE ARCH.

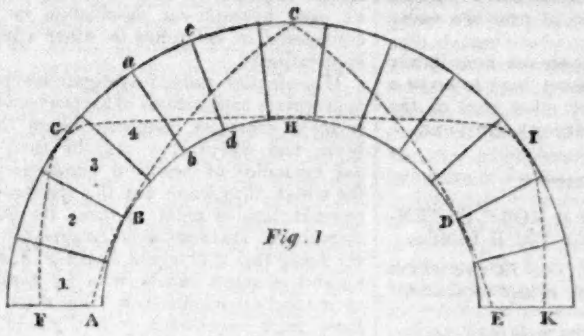


Fig. 1

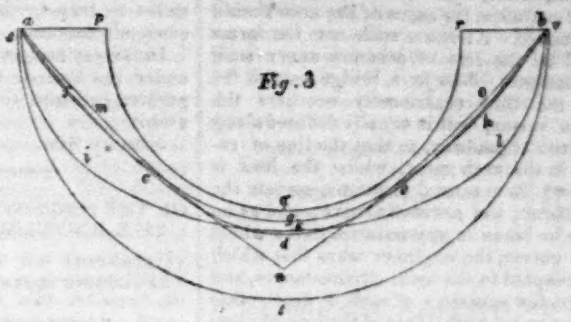
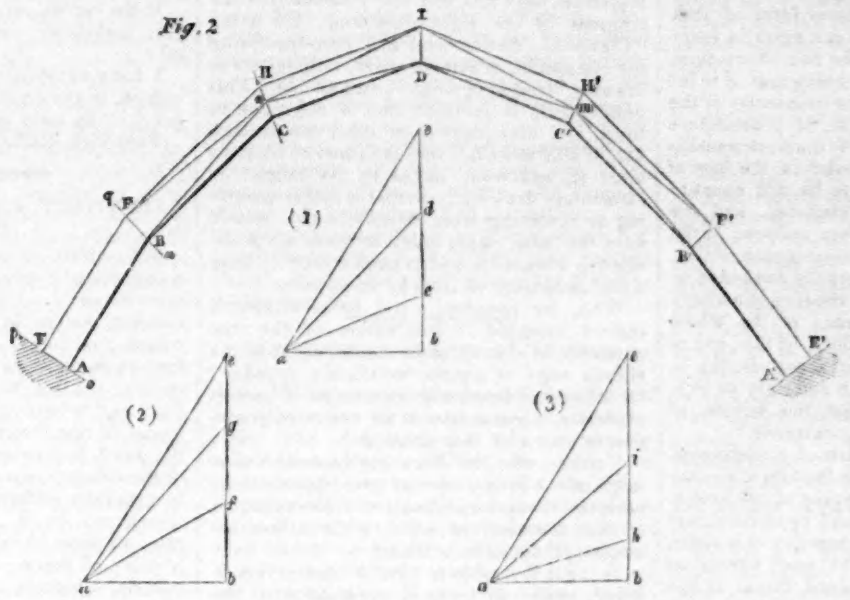


Fig. 3

Fig. 2



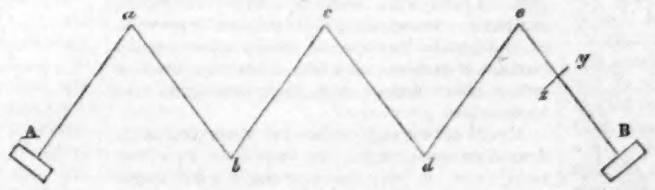


Fig. 4.

was loaded in the proportions above represented, the frame would be in equilibrium, even though friction did not act.

As no material is in reality perfectly smooth, so the pieces in the frame would in practice require some force to cause them to slide on each other at the bed-joints, and the friction, thus induced, would tend to preserve the equilibrium. If the resistance from friction at the bed-joints be taken into account, the proportions of weight may vary from that exhibited above within certain limits; these limits are defined by the magnitude of the angle of sliding; that is, the angle at which the pieces in the polygon would begin to slide upon each other.

To demonstrate this, let the proportion of weight be altered from that exhibited in (1), and instead, put the increased weight *bf*, (2), at the point I, *fg* at H, and *ge* at F, draw the lines *ab*, *af*, *ag*, and *ae*, and they will be the geometrical representatives of the magnitude and direction of the pressures on the bed-joints. Parallel to these lines, and within (if possible), the boundaries of the polygonal frame, draw the line I*m*, *m*B, BA, and the curve I*m*BA, will represent the line of pressure in one-half of the frame; and the angles at which this line of pressure intersects the bed-joints determines the stability of the structure; for so long as the angles I*m*H, *m*B*q*, BA*p*, are greater than the complement of the angle at which the pieces would begin to slide on each other, the structure is safe; but if I*m*H, *m*B*q*, or BA*p*, is less than the complement of the angle of sliding, then the pieces IC, HB, or FA, would begin to slide in the direction HC, FB, or EA; also if *m*ID is less than the complement of the limiting angle of friction, CI would slide upwards in the direction DI, so that on either of these suppositions, the polygon would be destroyed.

Also within the same limits the proportion of the load may vary by loading the haunches and reducing the weights on the crown, for let *bh* (3) be less than *bc* (1), and *hi* greater than *cd*. Then *bh* will be the weight at I, *hi* the weight at H, and *ie* the weight at F. The haunches of the frame are now loaded with a greater weight in proportion to the crown than they are in (1). From *a* draw *ah*, *ai*, *ae*, and parallel to them, within the polygon, draw the lines D*m*, *m*F and FE, and D*m* FE will be the line of pressure; and D*m*, C*m*, B*n*, and BA*o* will be less than the limiting angle of resistance, beyond which, if either go, the piece would slide on its adjacent bed-joint. Also, if *m*DI is less than the complement of the angle of sliding, the piece H would slide downwards in the direction ID. By the foregoing reasoning, it is shewn that if an arch be loaded at the crown, the line of pressure rises at the crown and descends at the haunches, and if the arch be loaded at the haunches, the line of pressure rises at the haunches and descends at the crown, so that if the load were on the crown, the line of pressure would be ABCDE, and if it were on the haunches it would be FGHIK. In order that in neither of these cases the voussoirs may slide on each other, the line of pressure must not at any point make an angle with either of the bed-joints less than the complement of the angle of sliding.

The second condition of stability is fulfilled so long as the line of pressure does not intersect either the extrados or intrados. When the crown is loaded, we see that the point nearest the extrados is C, and the points nearest the intrados are B and D, and, by increasing the weight, the line of pressure would intersect the boundaries of the voussoirs at one or more of these points, when it did, the consequence would be that the crown would descend and the haunches ascend the arch, being thereby destroyed. Again, if the haunches are loaded, the line of pressure approaches nearest the boundaries at the points GH and I, and if the load is increased the arch would yield at one or more of these points, when the crown would ascend and the haunches descend. These are briefly the geometrical principles of the two conditions necessary for the stability of the arch, from which we will endeavour to deduce some practical observations.

By examining fig. 1, it will be seen that if the arch is intended to support a heavy weight on the vertex, it should be of the *Gothic* or *pointed* form. If it be designed to sustain a load on its haunches, the form of the *ellipse* is

best adapted; and by reasoning equally clear it may be shewn that when the load is equally diffused over the horizontal roadway of the bridge, the form of the arch should be a *parabola*. And, lastly, if the load is diffused equally over the extrados, the curve of the arch should be a *catenary*. At least, such are the forms assumed by the line of pressure under such circumstances. Now in a bridge erected for traffic, the load occasionally occupies the haunches' vertex, or it is equally diffused along the horizontal roadway, so that the line of resistance in the arch must, whilst the load is undergoing these several positions, assume the *ellipse*, *Gothic*, and *parabolic* curve; and as no form can be taken to approximate to the whole of these curves, the engineer takes that which is best adapted to the local circumstances, and constructs the voussoirs of such a depth that there may be no probability of the line of pressure intersecting their boundaries, or forming an angle with the bed-joints less than the complement of the angle of sliding.

We have seen that whatever form of arch may be used in a bridge, it can never in every case be symmetrical with the line of pressure, the nearest approximation being that it is included somewhere within the boundaries of the voussoirs. These conditions, in practice, are again greatly modified both by the workmanship and material. If at any point in the line of pressure the resisting mass be not equal to the pressure, it becomes distorted, and the strength of the arch becomes reduced to the strength of that part. In consequence of this, the bridge would be as effectually weakened or destroyed by the failure or yielding of a single part as from the disturbance of the whole structure. And when we think of this, and of the variety of circumstances above alluded to, some of which cannot with certainty be estimated, can we wonder that the failure of bridges are of so frequent occurrence?

In a viaduct, which consists of a continuous row of similar arches built on the tops of slender piers, the thrust at the springing of one arch is counteracted by the equal and opposite thrust of the adjoining arches;* therefore it is clear, that if one were removed the next, having no counteraction to the horizontal thrust at the springing, would likewise fall, and at the same time the next also, and so on to the end of the viaduct, one arch following the other as fast as the resistances at the base are removed. We have seen that the strength of the arch is reduced to that of the weakest part, and that it would fall with the yielding of a voussoir; then, since the fall of an arch would cause the fall of the whole viaduct, the strength of the whole viaduct is reduced to the weakest part of the weakest arch, and if this at any time should give way, the whole would be destroyed. In a letter to you, dated 8th July, 1845, Mr. Dredge remarks on this subject as follows:—Suppose A*abcde*B, fig. 4, to be a viaduct, consisting of three arches, and A and B the extreme abutment; now, if from defective workmanship or other causes either of these piers was to yield, the whole viaduct would of course be levelled with the ground; or suppose from the mortar not being sufficiently dry at any part, as *yz*, that part was to yield, the whole viaduct would be as effectually destroyed as in the former case, when one of the piers gave way. It remains now to shew how to prove the above by a simple experiment.

The line of pressure in the compression arch is the same as a suspension chain when similarly loaded; so that if we take a chain of uniform weight, and hang it between two fixed points, *ab*, fig. 3, the curve *acdeb* assumed will be a catenary; if the weight be laid uniformly along the roadway, it is a parabola—*afghb*. If the load be at the haunches of the chain, the curve will be similar to an ellipse, *aiklb*; and lastly, if the weight be placed on the curve at the centre, the Gothic, *amnoh*, will be the form of arch. The only difference, therefore, between the curve of the line of pressure in the compression or suspension arch is position; the one curving downwards, and the other upwards, from the horizontal line. In a suspension-bridge, the curve of the chain would be the line of pressure; in a compression arch, the form of curve is positive, and the line of pressure must always be included within its boundaries; so that in the above figure, if a semi-circular arch be used (supposing the diagram reversed, and acting on compression), the boundaries, *pqr* and *stv*, must be drawn so as to include the lines of pressure under every circumstance.

In railway bridges, the voussoirs immediately under the line of rails must have to resist a greater pressure than any other part of the arch.

A Bridge Builder.

January 31st.

* When the adjoining arches are dissimilarly loaded, the thrust at the springing is not equal, and the resultant of the pressures on the slender piers is not perpendicular; this, when the dissimilarity becomes very great, may overthrow the piers, and so destroy the structure by that means.

ON THE NECESSITY OF A MORE EXTENSIVE KNOWLEDGE OF TRUE LINES,

AS ELEMENTS FOR DESIGN, AND AS THE MEANS OF JUDGING CORRECTLY OF FORMS BY SIGHT.

"Judgment also will I lay to the line."

It was with much pleasure that I read the extracts from Mr. Geo. Wallis's letter in The Builder, page 9, of this year; it exhibits some progress in the right direction. He says: "Clearness, distinctness, and precision being the end sought, as without these, intelligence in drawing" (and designing) "is impossible." This undoubtedly is correct; but in reference to lines, if I may judge from those enumerated, Mr. Wallis must fall very far short of what he aims at, and what ought to be taught in elementary drawing; so that whether designing or sketching from objects, artists should have the most ample stock of materials in the mind to work with, and to enable them to form a *just* judgment of lines by inspection.

Who, for instance, could have, without a correct example, a just notion of the true character of a wave of the development of the elliptic edge of a plain section of a cylinder? Or who could have, without a series of correct examples, a true notion of an extensive gradation of waves of that character?

Further, who can have any accurate knowledge of the orthographical projections, or the perspective representations, at different angles, of that character of wave, without true examples produced from them?

Is it not desirable to have a correct knowledge, under all these circumstances, of this most distinct character of waved lines? Surely this must be the case, and in connection with a perfect knowledge of the ellipse, for the edge of no other curve would develope the same line. Again, who, without correct examples, can have a knowledge, if I may so express it, of the family likeness of many other equally distinct characters of waved lines, and lines of many other forms, and their beautiful and harmonious gradation?

Mr. Wallis's suggestion for directing large drawings to be made by hand and eye from small ones, is just the reverse of what ought to be the practice. The most perfect lines on the most perfect planes, on as large a scale as possible to be convenient, should be the examples in the School of Design, and from such students should sketch to different smaller scales.

I am glad to see that Professor Cockerell is turning his attention to the elementary principles of design. Instead, however, of spending all efforts in research to ascertain what was the ancient practice, and then following that, which is only copying after all, would it not be better to try to discover and investigate new principles, and new applications of geometrical principles?

Had Mr. Stuart, or all those who have followed him to Greece, had the eye previously well tutored with the distinct varieties of true geometrical forms, would it not have facilitated the acquisition, and might it not have extended a knowledge of facts, as to the principles by which Greek architecture has been regulated?

Professor Donaldson has offered several suggestions to Mr. Lucas, who, I have no doubt, if he was familiar with geometrical lines of beauty, would experience great pleasure in discovering them in the most graceful forms, whether of architecture, sculpture, or the human figure, or other natural objects.

Dr. Whewell has expressed himself in a way in reference to the advantage of geometrical over analytical forms of study, which I should be glad if I could do as well, in pointing out the advantage of a much greater extension of the principles of geometry, and especially of a correct knowledge of curved lines that can be easily described and applied to architecture and designs in general. Mr. Hay, of Edinburgh, has, I understand, been directing particular attention to the application of the ellipses; this is well, but why should not mathematical waved lines and lines of contrary flexure of an easy geometrical description be equally considered in reference to other appropriate applications?

If professors would investigate and point out appropriate applications of known curved lines, select as examples instances where they have been, and where they may be used. Point out examples of beautiful geometrical lines, for which they know not the application, and suggest these or parts of them for the consideration of students, as elements for design. By doing this they would direct a host of assistants of active minds, who by inquiring of their teachers would draw from them answers from their experience, which would suggest new applications to designs. The following question, with the answer that would be given, would elicit many other questions.

What curves, or portions of what curves, give distinctive characters to the Ionic capital?

I have watched your reports with some attention, in the hope of finding this subject alluded to by some professor of architecture.

Feb. 16th, 1846. Joseph Jopling.

ARCHITECTURAL NOMENCLATURE—PLINTH.

Sir,—That the nomenclature of architecture is exceedingly vague, meagre, and bad, is not to be disputed. Of its vagueness, a striking instance occurs on the very same page (74), where you make some observations with reference to the term "soffit." What, allow me to ask, are we to understand by the term "plinth," where it is said that the restored model of the Parthenon "shews no traces of the plinth that existed between the lower parts of the columns of the posticum?" By "plinth" is generally understood a plain and narrow, tile-shaped block, placed *beneath* something else, in order to raise it and give it greater stability of footing, as beneath the base of a column, a pedestal, a vase, a statue, &c.; or if it be continued along a wall, it becomes either a *socle* or a *platband*, according to its situation. Yet in the instance alluded to, the *plinth* is spoken of as having been not only between the columns, but *nine feet* and an inch high! If so, it must have formed a screen-wall of that height, between the columns of the posticum, though it seems that the latter was inclosed by a *grille* or palisading of bronze. This needs some explanation, though the description would be intelligible enough, if instead of plinth, we were to read "a screen-wall of masonry" carried up between the columns to the height mentioned, and upon that a *grille* of metal-work filling up the remainder of the inter-columns (not intercolumniations!) as high as the capitals.

It is greatly to be wished (without reference to the article alluded to), that those who write architectural descriptions, would revise them, in order to see whether they are sufficiently explanatory, and in no danger of being misunderstood by those who must form their ideas of the building spoken of from the description given of it; which, by-the-bye, frequently amounts to no description at all. On the other hand, where description accompanies engravings of the buildings spoken of, it is as frequently, sheer impertinence, telling us only what is plainly enough to be seen in the engraving, without further remark of any kind, and without any explanation at all in regard to a variety of particulars which cannot be made out from what is shewn.

Budownik.

Workers in Iron.—Jabez James, the smith whose work in the new buildings at Lincoln's Inn we had occasion to praise some time ago, has just completed a beautiful model in iron, of a large roof over the ship-building slips in one of the dock-yards. It is made very accurately, to scale; shews every bolt, distinguishes the parts that are of wrought-iron from those of cast, and is altogether greatly to the credit of its ingenious maker.

The Regent's Canal Railway project is abandoned for want of the necessary deposits. Each share is to contribute 7*s.* 6*d.* for expenses.

POLYCHROMATIC DECORATIONS.

At a meeting of the Decorative Art Society, on the 11th inst., a paper was read by Mr. Crabb on "Polychromatic Decorations," illustrated by numerous Oriental and Italian drawings. The writer prefaced his remarks by expressing regret that the Government School of Design had not found ability to take up the subject, the importance of which, at the present time, demanded more extended and immediate consideration than the society might probably bestow upon it. The laws and operations of colours were then briefly described, and followed by an allusion to the mental gratification, distinct from other benefits, which would accompany an extended acquaintance with the principles that have regulated the practice of polychromatic art in past times. It was argued, that, in admitting colour to have a powerful effect upon the mind, exhilarating the animal spirits according to the introduction of brilliant and stimulating hues, or depressing them by quiet and neutralizing tones, it would follow as a great fundamental principle, that for decorative purposes we should adopt a style of colouring tending to induce or promote the peculiar train of sentiment for which the building or apartment is chiefly intended. Mr. Crabb stated, that the purpose of his paper was to elicit some ready means by which to classify the distinct styles of polychromatic art for practical utility, and he proposed an arrangement under *three grand divisions*. The *first*,—applying to Greek and Roman architecture only, would include colouring by the Greeks and Romans, and by the Italians at the Revival to the combination of ornamental with historical art; with sub-divisions to ecclesiastical and palatial edifices, and a distinct appropriation to the particular style of decorative art practised at Venice; the *second* division to embrace early Oriental, Byzantine, and Arabian Art, and the application to Gothic architecture with sub-divisions; the *third* division to comprise the second Revival in Bavaria and France, and its anticipated extension to England. He then observed, that antecedently to the 15th century we find in Roman buildings, as the baths of Titus, the walls of Pompeii, &c., decorations of a light style of Arabesque painting occupying the larger proportion of surface, with brilliant colours introduced as accessories, but kept subordinate in importance to the mythological tableaux. It was said, that these decorations were well-calculated to impart cheerful embellishment to chambers which were imperfectly lighted or of small size, and that they are distinguished for a pleasing proportion of relative parts, and display in many instances the great refinement and elegance of Greek art. Also that, subsequently to the 15th century, the palatial edifices of Italy exhibit the revival of a similar style, at first inferior in proportional design, but afterwards, owing to the extraordinary talent of the artists, greatly superior, as instanced in Raphael's Loggia, the hall of the Villa Madama, the Ducal Palace of Mantua, the Gallery of Cupid and Psyche in the Palace Farnesina, and other great works executed in Milan and Genoa; also that the churches and ecclesiastical buildings were marked by an increased richness of effect, as the magnificent church of St. Maurizio, Milan, and in the church and superb dome of St. Maria del Popoli, Rome.

He then referred to the library of the cathedral of Sienna, where the tableaux assume the importance of histories, and the richest Arabesques upon scarlet, blue, and golden grounds, are assisted by exquisite stuccos and a connecting series of paintings of the history of Pope Pius II., and yet further, in the Campo Santa at Pisa; and in the Capella Sistina, Rome, which, as it is considered one of the most exalted efforts of fine arts, so it is strictly a work of decorative art. Descriptions were then given of several Italian details. In reference to the *second* division, it was said that Hindostanee, Persian, early and late, Byzantine, Arabian, and Moresque, ought to be classed as of one family, differing only in individuality. The distinction between the use of colours on flat surfaces and that of rendering the ornaments in coloured mosaics,—no more changing the character of the style than did the introduction of stuccos affect the Italian. Mr. Crabb next described the ancient and magnificent Hindoo Temple at Ajmer, with its superb screen of Saracenic *coloured* architecture; also that fine specimen of Arabian art, the great Mosque of Cordova, with its coloured enrichments; noticing especially the gate of the Koran, whose intrados in mosaics of gold, blue, red, and green was of singular beauty, corresponding with similar works at Damascus and Bagdad; and it was observed, that the ceiling of wood exhibits colouring analogous to what is subsequently found in Gothic architecture. The grand palace of the Alhambra was noticed; also the polychromic peculiarities of several buildings at Agra and Delhi, making reference to elaborate coloured drawings. The Court of the Taj was said to be 950 by 320 feet; its two mosques and grand gateway being of *red* sandstone, enriched by cast stuccos, white and blue; the central immense mausoleum being of *white* marble and gold, with coloured enrichments. The magnificent structure, forming Actmed Ab Doulah's tomb within its towers, were said to be of white marble, richly illuminated, both exterior and interior, and rising from a terrace of *red* sandstone. Mr. Crabb, in commenting upon the ornamental details, stated that religious precepts forbade the representation of animal life, and that the enrichments were composed of flowers, bands, and combined convolutions of forms perfectly conventional, and designed to express colour. The profusion of ornaments was said to be distinguished by great variety and singular delicacy of execution; also that painting and sculpture were odious to the first Moslems, but that, subsequently, both western and eastern Caliphs evaded this prohibition of the Mahommedan law.

WESTMINSTER COURT OF SEWERS.

On Friday a very numerous Court of Sewers was held, when Mr. Leslie was chosen chairman. The cash balance at the treasurer's was declared to be 12,269*l.* 16s. 8d.; and several small accounts were paid. Mr. Cumberlege called the attention of the Court to the extraordinary fact that the premises had never been insured against fire. Messrs. Allason and Mayhew immediately examined the building, and reported to the Court; whereupon an insurance was effected, during the sitting of the Court, for 4,000*l.*, in the Westminster Fire Office.

A special Court was ordered for Tuesday, the 24th inst., at 12 o'clock, to consider the steps necessary to be taken by the commissioners, in consequence of the contemplated interference with the sewers by the many projected schemes of sewage and railway companies before Parliament.

An immense number of petitions for new sewers and drains was then disposed of in favour of the petitioners.

A very important decision was come to by the Court in the case of Clarke and Manning. The former being possessed of two houses in Bell-street, Paddington, wished permission to enter drains into the sewer for one house only. The latter refusing to allow him without paying a frontage of 15s. a foot. The Court thought it reasonable that both of the adjoining houses should be drained at once, and determined that Mr. Clarke should be at liberty to drain them on payment of 10s. per foot frontage. Mr. Clarke then tendered the sum, which Mr. Manning refused; and the Court ordered Mr. Clarke to enter the drains of the two houses into the sewer.

On the motion of Mr. T. L. Donaldson, seconded by Mr. George Knight, 100 feet was the maximum length to be allowed for No. 3 sewer, on summit levels and confined localities.

The attention of the Court was called to the filthy condition of a sewer in Charles-court, Strand, in which it was stated the soil had accumulated to within six inches of the top of it.

Messrs. Stunt, Poupart, and Thompson appeared to their summons; and Mr. Gunter, from his place, stated that the injury to the bank of the Kensington Canal, which was complained of as being weakened by default, neglect, or commission of the parties or their servants, and likely to be of most serious damage to their lands and the public, was caused by the acts of the commissioners themselves. The Court ordered its powers to be set in motion, through its solicitor, to compel the parties to secure the bank complained of.

It was resolved, that a second special court in the ensuing week be held on Friday, the 27th inst., at 12 o'clock precisely, to consider certain motions of which notice had been given.

The remaining business on the paper was then proceeded with, and Mr. Doull, the assistant surveyor, having presented a return of the actual expenditure upon works under 50*l.* for the six weeks from Christmas 1845, to the 5th February, 1846, from which it appeared that the total expense of those works was as follows:—

Eastern division	£61	1	8½
Western division	102	9	7½
Ranelagh district	77	11	9
Counters Creek district	18	17	2½
General disbursements	19	0	3
	279	0	7½

The Court ordered the return to be printed.

On Tuesday, the Metropolitan and the London Sewage Manure Company's Bills were considered, and it was agreed that a clause drawn up by the solicitors of the commission, should form the basis of an application to Parliament *against*, but not hostilely to, the projects.

REPORT OF THE GAUGE COMMISSIONERS.

This report, to which we have frequently referred during the past six months, has at length made its appearance. The commissioners were Sir J. M. F. Smith and Professors Airy and Barlow. Their inquiries were directed to three points:—first, whether a uniform gauge should be compulsory on all future railways; secondly, whether it is possible to obviate or mitigate the evil arising from want of uniformity; thirdly, whether it is expedient or practicable to effect a uniformity in railways already constructed, or in process of construction. In considering these questions, it became necessary to decide a fourth, as arising immediately out of the third, viz.: which of the gauges is preferable for general purposes.

On the first point, involving the more abstract advantage of uniformity, one decision only could have been anticipated. The commissioners considered it under the following heads:—as applying to fast trains, to ordinary trains, to goods' trains, and to the conveyance of troops. With regard to the first head, they do not think the inconvenience of a break of gauge of sufficient importance to call for legislative interference. With regard to the second and third, they pronounce the break an intolerable evil, imperatively demanding remedial measures; and with regard to the fourth, they are of opinion that it might expose the country to serious danger. On the second point, after considering in detail the various plans suggested of mingling the broad and narrow gauges by double lines of rails, or of adapting the carriages to fit either gauge by shifting wheels or placing them on trucks, they pronounce them severally to be impossible or dangerous, and arrive at the conclusion that none of them are calculated to remedy in any important degree the inconveniences attending a break of gauge. The third point, which they justly deem the most important, and have investigated with great minuteness, is treated in conjunction with the fourth, and is indeed merged in it.

The question of the comparative merits of the broad and narrow gauges is examined under four divisions:—safety, accommodation and convenience for passengers and goods, speed, and economy. We extract the opinions of the commissioners in their own words:—

"1. As regards the safety, accommodation and convenience of the passengers, no decided preference is due to either gauge, but on the broad gauge the motion is generally more easy at high velocities.

2. In respect of speed, we consider the advantages are with the broad gauge, but we think the public safety would be endangered in employing the greater capabilities of the broad gauge much beyond their present use, except on roads more consolidated, and more substantially and perfectly formed, than those of the existing lines.

3. In the commercial case of the transport of goods, we believe the narrow gauge to possess the greater convenience, and to be the more suited to the general traffic of the country.

4. The broad gauge involves the greater outlay, and we have not been able to discover, either in the maintenance of the way, in the cost of the locomotive power, or in the other annual expenses, any adequate reduction to compensate for the additional first cost."

From these opinions, the conclusion is of course irresistible, that the narrow gauge is on the whole to be preferred, and that its uniformity is to be imperative, and if an alteration is to be made, it should be from the broad to the narrow. This conclusion is greatly strengthened by the fact, that there are of the former only 274 miles at present in work to 1,901 of the latter; and whilst the whole cost of the one alteration, including every possible expense, would not much exceed a million of money, the capital required for the other would be incalculably greater. To adapt the broad lines to the narrow gauge would be nothing more than to approximate the rails; but to convert the narrow into the broad would be to build new bridges and new tunnels, and, in short, to reconstruct the entire road.

RAILWAY JOTTINGS.

Mr. Robert Stephenson has laid before the directors of the Chester and Holyhead line, a report upon the practicability of erecting a railway communication over the Menai Straits. It appears, that he has availed himself of the assistance of Mr. Fairburn and Mr. Hodgkinson; the former so well known for his thorough practical knowledge in such matters, and the latter distinguished as the first scientific authority in the strength of iron beams. The result is a conviction that a *rectangular tube*, 450 feet long, supported on stone pillars at both ends, will prove the safest and most economical structure to meet the difficulty.——The works of the new tunnel, which is to extend from just above the Edge-hill station to the north end of Liverpool, are in progress, and will be completed with all possible dispatch.——The Post Office has accepted the offer of the Brighton company to carry a bag of letters by every train *gratis*. The South-Eastern has followed the example thus set, and doubtless will meet with a similar result.——Mr. Locke, in his report to the directors of the Richmond line, states that the viaduct across the Wandle is more than half built, and more than one-half of the excavation of the entire line has been removed. Several over-bridges between Putney and Barnes Common have been built, and the lighter earthwork and bridges are proceeding as rapidly as is needful. The only part not begun is at the Richmond end, but here the line will be formed nearly on the surface of the ground, and a few months will suffice for completing it after possession of the land is obtained. The line may be completed by June next.——The directors of the Newcastle and North Shields state, that since the opening of their new line, 5,289,000 passengers have travelled on it without receiving a single accident.——For a long time past, apprehensions have existed as to the security of the viaduct on the line of railway from Chippenham towards Corsham, and several workmen have lately been employed in propping and repairing the supports of the embankment near the station, in the hope of preventing any mishap. On Saturday last repeated creakings were heard throughout the day, and about seven o'clock in the evening the wing wall and part of the embankment under the up-line gave way with a loud crash. Fortunately, no personal accident occurred. Another slip has also occurred near Wootton Bassett, but it was much less considerable than that near Chippenham.——A few days since, the chairman of the Colchester, Stour Valley, Sudbury, and Halstead Railway committee, referring to the non-attendance of two witnesses who had been summoned to give evidence, but whose employer, a Mr. Sarjent, would not allow them to appear, said that in the event of their not presenting themselves the following day, the Speaker's warrant would be issued against them all. This threat, which involves very heavy fines and imprisonment, had the desired effect.——A serious and savage affray has recently taken place between the English and Irish labourers employed on the Lancaster and Carlisle line. It is well known, that such outbreaks can be prevented by the contractor or his subordinates; such being the case, the greatest surprise and dissatisfaction has been felt at the neglect evinced on this occasion.

ART-SAYINGS—AFTER GOETHE.

What is art-work? You look at it—you gaze, observe, examine! Criticism may arise; but you soon find *yourself* in fault—not the artist. One beauty—one harmony starts after the other; beauty *is* harmony. You view the work from a hundred sides, from a hundred views, you combine these different radii—*they* all combine, unite, centre in one focus, one thought, one mind-thought. Wherever and however you probe, analyse, scrutinise—the artist has done all the same before you—for you. There is no getting at him—behind him; the best you find, after all, is to follow after him.

What is "not" Art-work?—What *would* be something—and, in reality, is nothing, absolutely no-thing. You look at it! At every point and corner it offends you, pinches you, disheartens you. You endeavour to lay some plan, some harmony in *any* part of it. It will not do—nothing will ever tally with any thing; every thing contradicts itself and every thing around. If, in the former case, the idea seems to have sprung from heavenly brains—all perfection all unity; it is here, as if some *infernal* power had *toiled* and *toiled* hard; still, to no purpose. It is a work of toil, and pain, and deceit and conceit—but the divine is not in it.—*Genius nascitur—tandem fit.*

DUTY OF A MASTER TO HIS APPRENTICES.

On the 16th instant, an action was brought in the Court of Common Pleas, by the trustees of Marsh, who is the apprentice of the defendant Emmerton, for the breach of covenant in his indenture of apprenticeship, in not teaching him his trade as bricklayer and builder. It appeared that he had paid a premium of 25*l.* and that after being three years and a half at his trade he was quite ignorant of its more advanced arts and mysteries, whereupon his trustees demanded that he should either be properly taught, or that his premium should be refunded. This latter demand was refused, and the present action was therefore brought. Evidence was gone into to shew the ignorance of the boy in different branches of his trade. On the other side witnesses were called to shew, that he had every fair opportunity of learning his trade given to him, and that his ignorance of it was to be attributed to his own neglect and fault.

The jury found a verdict for the defendant.

Correspondence.

WESTMINSTER ABBEY—CONTEMPLATED IMPROVEMENTS.

Sir,—There is a passage in your correspondent's letter, signed □ (p. 47), relative to the proposed alterations, which I think requires notice. It is the one in which he applies the term beautiful to those outrageous abortions, the oak screens inclosing this beautiful choir.

As they are to be removed, I trust the dean and chapter will not allow them to be refixed, to detract any longer from the grandeur of one of the finest interiors we possess.

I am, Sir, &c. Samuel Field.

Beaufort-buildings.

Glass Saloon.—The Manchester Botanical and Horticultural Society propose to erect a new saloon in the gardens of Old Trafford, of sufficient size to receive the usual exhibition of flowers, plants, and fruit, and all the promenaders, and to be also available for lectures on botany, vegetable physiology, vegetable chemistry, &c. It is to be 150 feet by 45 feet; and 22 feet in height to the centre of the dome, or 32 feet to the centre of the dome ventilator. The whole of the front of this saloon is to be made of glass, and moveable, so that it may be removed in bright, hot weather. In short, the new saloon will have a back wall and two end walls, while the other side, and the whole of the domed roof will be of glass, covering an iron framework. Possessing an area of 6,750 square feet, or about 740 square yards, it will accommodate nearly 2,000 persons.—*Manchester Guardian.*

The new Wet-dock at Troon, Ayrshire, was opened for the admission of vessels last week.

Miscellanea.

Formation of Portland Vase.—At a meeting of the Society of Arts on 18th February, the discussion on the Portland Vase was resumed. Mr. Doubleday, of the British Museum, who has repaired the Portland Vase, exhibited a number of specimens of ancient glass manufactures as illustrative of the theory which he deduces as the true principle of its construction. He imagines the blue body of the vase to have been first made, and then covered with a thin coating of semi-transparent white glass, by dipping it into that material while in a state of fusion. The vase, he supposes, was next placed in the hands of the artist, who by a process similar to cameo cutting or gem engraving, produced the beautiful designs in relief which now adorn its surface. He also stated in confirmation of his idea of the mode in which the vase was constructed, that while engaged in repairing it, he observed that there existed a coat of white glass underneath the handles, at the points at which they are united to the vase. Mr. Pellatt and Mr. Christie, who were present, and who are practically acquainted with the manufacture and working of glass, addressed the meeting, and quite concurred with Mr. Doubleday in the view he had taken of its construction; but from their statements it would appear, that after all, the great merit of the work rests with the artist, as there is no difficulty at the present day, in manufacturing similar materials. Mr. Doubleday stated, that the bottom of the vase did not originally belong to it, and from the style in which it is executed, he should consider that there is a difference of 200 years in the date of their execution.

St. Mary-le bone Bank for Savings.—The sixteenth annual general meeting of this institution was held on Thursday, the 12th of this month, at the office No. 76, Welbeck-street, Cavendish-square. The Rev. J. H. Spry, D.D., in the chair. It appeared from the several reports read to the meeting, that the progress of this bank continues to be of a very favourable description, no less than 2,418 new deposits having been made in the last year, 16,201 deposit accounts remained open on the 20th November last, of which no less than 10,628 held balances averaging less than 4*l.* 7*s.* each. Upwards of 356,954*l.* was then invested with the commissioners for the reduction of the national debt. The continued evidence thus afforded of the strong and growing disposition of the working classes to provide against the casualties of life, will prove a source of gratification to all reflecting minds; and it may indeed be hoped that this provident disposition has its influence in improving the character and conduct, this class of workmen being the last to be discharged whenever establishments are reduced from scarcity of work.

Lord Northampton's Soirees to the Royal Society.—The first for the present session, held on Saturday evening last, was one of the most brilliant meetings that can be imagined. Men of all ranks and parties,—statesmen, philosophers, men of letters, and artists, thronged the rooms, and formed such an assemblage as is seldom seen. Prince Albert arrived soon after ten o'clock, and remained until half-past eleven. Parsey's compressed air-engine, some magnificent specimens of "coated glass" of British manufacture, specimens of carving by machinery (two modes), and a nice model of the Temple of Jupiter Olympus, were amongst the most noticable matters exhibited. To give a list of the men of mark who were there, would fill several of our columns.

New Houses of Parliament, &c.—On the motion of Sir R. H. Inglis, a select committee of the House of Commons has been appointed to consider "the present state of Westminster-bridge and of the new palace at Westminster, particularly with reference to the reception and accommodation of this House in the same."

New Churches. — At a meeting of the Incorporated Society for Promoting the Enlarging, Building, and Repairing of Churches, held last week, grants were voted in aid of the erection of new churches at Westleigh, near Manchester; Macclesfield Common, Northend, near Penrith; and Walcombe, near Bath; also for enlarging churches at Stort, near Devizes; Bicford, near Driffield; and St. Edwin's, near Haverfordwest.

NOTICES OF CONTRACTS.

[We are compelled by the interference of the Stamp Office to omit the names of the parties to whom tenders, &c., are to be addressed. For the convenience of our readers, however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent-garden.]

For the execution of three contracts on the South Wales Railway, being a distance of about 14 miles.

For removing a large quantity of Brick Earth from the neighbourhood of Euston-square.

For building a sewer in George-street, Harwood-street, Hampstead-road, to the extent of 422 feet, and another in Upper Southampton-street, Pentonville, for a length of 180 feet, for the Holborn and Finsbury Commissioners of Sewers.

For supplying Her Majesty's several Dock-yards with Riga fir timber, Dantzic deck deals, fir timber, and Norway spars.

For supplying the Ipswich and Bury St. Edmund's Railway with coal, goods, and ox waggons, passengers, luggage-vans, &c.

For erecting the new market, butchers' shops, &c., and pulling down some old buildings, in the borough of Dorchester.

For the supplying, erecting, and working (ten hours daily) a portable steam-engine and boiler for the Southampton sewerage commissioners.

For building the foundations of a tower and nave of Kentish rag stone for the directors of the Victoria-park cemetery.

For the execution of two portions of the Edinburgh and Northern Railway, being of the respective lengths of 3 and 5 miles.

For the execution of works on the Leeds, Dewsbury, and Manchester Railway, being a length of about 3½ miles,

For the execution of works on the Dundee and Perth Railway.

For works to be done in making additions to the Rectory House, in the parish of All Saints, Poplar.

COMPETITIONS.

The Building Committee of the Walworth Literary Institution are desirous of obtaining plans and elevations for a building suited to the purposes of the society.

The Directors of the Hull General Cemetery Company are ready to receive designs for laying out and ornamenting their grounds, and for a suitable chapel, entrance lodge, &c. A premium of twenty guineas is offered for the design most approved of, and another of ten guineas for the next best.

APPROACHING SALES OF WOOD, &c.

BY AUCTION.

In Twickenham Park, near Richmond Bridge: 137 prime oak, elm, ash, lime, fir, chestnut, and other trees.

At the Beaufort Arms Inn, Monmouth: 51 oak timber trees, of superior quality.

At the Fleur-de-Lis Inn, Lowsonford, near Warwick: 68 capital oak, elm, ash, alder, fir, and pear trees, mostly of superior growth and large dimensions.

At the Plymouth Arms Hotel, Tardebigg: 540 superior oak timber trees.

At the Cock Inn, Monks Kirby, near Rugby: 79 oak, 129 ash, 55 elm, 8 fir, and 1 beech trees, of long lengths, large dimensions, and very excellent quality.

At the White Horse Inn, Romsey, Hants: upwards of 3,000 superior oak timber trees, chiefly from 15 to 60 feet metings.

On the North Lodge Estate, Enfield, Middlesex: 780 oak timber trees, felled last spring.

At Walroad's-park Farm-house, Isle Brewers, Somerset: 198 prime elm, 52 oak, and 3 ash timber trees.

TO CORRESPONDENTS.

"C. J."—*We doubt if the custom alluded to is binding in law, but a tenant from year to year is liable for all dilapidations arising from negligence, avoidable accident, or wilful damage.*

"G."—*Our own opinion of Bath stone is not sufficiently favourable to allow the insertion of his letter. Any remarks on points to be attended to in the selection of the stone would receive consideration.*

"Practical Man."—*Bernan's work on Warming, &c., is the most comprehensive. Bell, Fleet-street, is the publisher.*

"G. A. C." *will find title-page and index to third volume in first number for present year.*

"T. L."—*Either Laxton's, Crosby's, or Skyring's price book may be obtained through any bookseller.*

"Gradients."—*A correspondent wishes to know what is the greatest rise that can be given to a railway for locomotive engines, and what for atmospheric.*

"Depretor."—*A correspondent asks which is the best way to do "depretor," that is, plastering done to represent* tooled *stone; it is the* marking *of the plastering that I am at a loss for. Is there any particular tool used?*

"B. N."—*The architect is the proper person to be applied to.*

"J. B." Ollerton.—*The second volume of* THE BUILDER *can be had complete of the Publisher: the first volume can also be had, minus a few numbers, and these may probably be obtained by advertising for them.*

"J. A. P."—*Thanks: he shall hear from us.*

"W. J." (Llanidloes).—*The application of soap and alum to exclude moisture from external walls was first proposed by Mr. Sylvester. Mr. Ferrey tested it, and found it successful. We should be disposed to try it in the present case.*

"Constant Subscriber."—*We decline recommending.*

"R. D."—*Messrs Manby, the engineers.*

"E. J. P."—*Our arrangements will not allow us to comply at this moment.*

Received.—"Carbon," "J. K.," "W. Ford," "Mr. Spencer," "W. H. J. T."

ADVERTISEMENTS.

MESSRS. BECKWITH AND CO.'S MARCH LIST OF INVESTMENTS. The attention of Proprietors of House and Landed Property wishing to sell is invited to the advantage of having them inserted in the March list about to be published. This forms a means of giving publicity to the nature of the investment without making public the exact whereabouts of the property, so that all undue notoriety is avoided.

The list within a few days of its publication will be in the hands of at least 500 genuine buyers, giving a facility for sale by private treaty altogether unprecedented. No charge whatever is made until a sale is effected. BECKWITH AND CO., Estate Agents, 25, Bucklesbury.

TO BUILDERS, PLUMBERS, ENGINEERS, AND IRONMONGERS.

BEST PAN WATER-CLOSETS, with round Valve, complete, 30s. each.

Plumbers' Bib, Ball, and Stop Cocks, ½ in., 20s.; ¾ in., 28s.; 1 in., 56s. per doz.

Lifting Force Pumps on Planks, 2½ in., 4*l.*; 3 in., 4*l.* 15s.

Washing Coppers, 1s. 1d. per pound.

Water Balls, ¾ in., 15s. per doz.

Gun Metal Steam Cocks, Safety Valves, &c., and every description of Brass and Copper Work equally low, at A. McGLASHAN and Co. Brassfounders and Coppersmiths, 16, Long-acre.—N.B. Every article warranted.

HERRING'S PATENT SELF-ACTING WINDOW SASH. This important invention was exhibited before the whole body of British Architects, at the Royal Institute, Grosvenor-street, Bond-street, 23rd Feb., 1846, Wm. Tite, Esq., in the chair; after a most searching investigation as to its real merits, it was universally approved and recommended for general adoption, effectually to prevent those dreadful accidents and loss of life so frequent in cleaning windows. Builders and others in the Country will have a full-sized window (not Glazed) forwarded on receiving an order and reference, and taken back if returned free within eight days. It is a mere trifle for extra labour in applying this patent to a new window or to those now in use. The sashes are instantly taken out for all purposes without disturbing the beads, and as easily replaced by the meanest capacity. Looking at the great evils this will obviate, and the many advantages to be gained, no respectable family should be without it. To be seen daily from 12 to 3, and Licences granted by the Patentee, 14, Kingsgate-street, London. It was remarked, that Builders would be considered nothing less than insane to put in windows upon the old plan, and that no family would risk the lives of th ir servants and workmen when a preventative can be had at a trivial expense.

CALIGRAPHIC BLACK LEAD PENCIL.
Manufactured by E. WOLFF and SON, 23, Church-street, Spitalfields, London.

THE CALIGRAPHIC PENCILS have been invented by E. WOLFF and SON, after the expenditure of much time and labour. They are the result of many experiments; and every effort that ingenuity and experience could suggest has been made to ensure the highest degree of excellence, and the profession may rely upon their being all that can be desired. They are perfectly free from grit; and for richness of tone, depth of colour, delicacy of tint, and evenness of texture, they are not to be equalled by the best Cumberland Lead that can be obtained at the present time, and are infinitely superior to every other description of pencil now in use.

The Caligraphic Pencils will also recommend themselves to all who use the Black Lead Pencil as an instrument of professional importance or recreation, by their being little more than half the price of other pencils—

H, HH, HHH, HB, B, BB, F, FF, W° .... 4s. per doz.
BBB, EHB ..... 8s. ,,
BBBB ..... 12s. ,,

* This pencil is particularly recommended for writing and counting-house use.

An Allowance on every Gross purchased by Artists or Teachers.

May be had of all Artists' Colourmen, Stationers, Booksellers, &c.

A single Pencil will be forwarded as a sample, upon the receipt of postage stamps to the amount.

CAUTION.—To prevent imposition a highly finished and embossed protection wrapper, difficult of imitation, is put round each dozen of Pencils. Each Pencil will be stamped on both sides, "Caligraphic Black Lead, E. Wolff and Son, London."

*** The usual trade allowance to stationers, booksellers, &c. A Show Box Gratis with an order for a gross of Pencils.

ATKINSON'S CEMENT.—The public is respectfully informed, that the price of this very excellent Cement, which has now been in use for Architectural and Engineering works upwards of thirty years, is reduced to 2s. 3d. per bushel, and may be had in any quantity at Wyatt, Parker, and Co.'s Wharf, Holland-street, Surrey side of Blackfriars-bridge.

N.B.—This Cement being of a light colour, requires no artificial colouring or painting, and may be used for stucco with three parts its own quantity of sand.

PORTLAND CEMENT, which does not vegetate, and requires no colouring, is perfectly hydraulic, and resists the action of Frost. The cost of the material and of working it is about the same as Atkinson's Cement, Manufactured by J. B. WHITE and SONS, Millbank-street, Westminster, and sold at their Warehouses:—
Druce's Wharf, Chelsea,
Bell's Wharf, Paddington,
Earl-street, Blackfriars,
Albion Wharf, Deptford-bridge,
by Salmon and Co., Dublin,
and at 36, Seel-street, Liverpool.

ROMAN CEMENT, &c.
REMOVAL.
THOMAS JOHN CROGGON
Begs to inform the Trade that he has removed to
8, LAWRENCE POUNTNEY-HILL and
THREE CRANES WHARF, 69, Upper Thames-street.
Orders addressed to either place for ROMAN CEMENT of genuine quality will be executed with promptitude and the strictest regard to quality and economy.

KEENE'S PATENT MARBLE CEMENT.

WITHOUT noticing CAUTIONS, which are as absurd as they are uncalled for, or disproving assertions, which carry with them their own refutation, the patentees of KEENE'S CEMENT venture to believe, that this material will very advantageously stand the test of comparison with any cement of a similar nature, however INVALUABLE, now before the public. They derive this opinion from its all but exclusive use in the new buildings north of Hyde-park, on the Brompton estate, and in many other public and private edifices, both in London and the country. Amongst others may be mentioned the works recently executed at the Colosseum, Regent's-park, where its hardness and beauty of appearance have caused it to be extensively used for skirting and other mouldings, in place of wood, for columns instead of marble, and as a substitute for stone in paving the floors of the corridors and conservatories.

Patentees and manufacturers, J. B. WHITE & SONS, Millbank-street, Westminster,

MARTIN'S FIRE-PROOF AND ORNAMENTAL CEMENT.

CAUTION.—Messrs. STEVENS and SON, Patentees, beg to caution their friends and the trade generally against confounding this invaluable Cement with others, erroneously said to be of the same description. S. and S. pledge themselves, that MARTIN'S CEMENT is totally dissimilar in composition and manufacture from every other, and, being a neutral compound, is not only free from chemical agency upon any substance with which it may come in contact, but completely resists the action of the strongest acids. They feel it a duty to direct attention to the following properties, which it exclusively possesses:—

1. It rapidly acquires the hardness of stone.
2. Unlike other internal cements, its hardness is uniform throughout its entire thickness.
3. Its surface (which may be made equal to that of the finest marble) NEVER THROWS OUT ANY SALT, and will receive paint in four days, without peeling, when put upon dry work.

It is peculiarly adapted as an internal stucco for walls, skirtings, architraves, mouldings, and enrichments of all kinds, to all of which purposes it has been extensively applied by Mr. Thomas Cubitt on the Grosvenor estate, &c.

For the above purposes, it possesses great advantages over wood, being more economical and durable, resisting fire, damp, and vermin.

For the floors of hall and fire-proof warehouses, its lightness, durability, and uniform surface give it an immense advantage over stone, being, at the same time, much more economical. The most satisfactory references can be given. To be had of the Patentees, Plaster of Paris and Cement Manufacturers, 186, DRURY LANE.

Agent for Liverpool and Manchester, Mr. R. PART, 28, Canning-place, Liverpool.

TO ARCHITECTS, ENGINEERS, CONTRACTORS, BUILDERS, MASONS, AND PLASTERERS, MERCHANTS, SHIPPERS, AND THE PUBLIC IN GENERAL.

JOHNS and CO.'S PATENT STUCCO CEMENT.—The following are the positive advantages possessed by this Invention over every Cement hitherto introduced:—It will effectually resist Damp. It will never vegetate nor turn green, nor otherwise discolour. It will never crack, blister, nor peel off. It will form a complete Stone casing to any Building covered with it. It so closely resembles Stone that it is impossible to detect it. It never requires either to be painted or coloured. It will keep fresh and good in the cask in any Climate for any number of years. It is the only Cement that can be depended upon for export. It is the only Cement that can be used with confidence by the Sea-side. It may be used in the hottest or coldest Climates at any season. It will adhere to any substance, even to Wood, Iron, or Glass. It will carry a larger Proportion of Sand than any other Cement. It matures by age, and becomes perfect when other Cements begin to perish. It may be worked through the Winter, as frost has no effect upon it. It may be used on the Inner Walls of new Houses, which may be papered over or painted directly. Roofs laid or pointed with this Cement will remain undamaged by the severest Storms. Any Plasterer may apply it, the Instructions for use being very clear and distinct. The first cost of this material does not exceed that of the cheapest Cement now in use; but with all the above-named extraordinary and valuable advantages, nothing can approach it in point of economy.

Architects and Builders who have used this Cement have declared that it requires only to be known, to be universally preferred.

Specimens may be seen, and a Prospectus fully describing the Cement and its mode of application, together with a volume of Testimonials from every part of the Kingdom, may be obtained on application at the office of "The Builder," and of MANN and CO., SOLE AGENTS for the Patentees, 5, Maiden-lane, Queen-street, Cheapside, London: of whom also may be had,

JOHNS and CO.'S PATENT STONE-COLOUR STUCCO PAINT, expressly intended for Painting over exterior Walls of Houses that have been covered with Roman or other Cements, and which have become dirty and discoloured. It is in every way better suited for this purpose than White Lead Paint, which will frequently come off in flakes, being in direct chemical opposition with Cement; whereas MESSRS. JOHNS and CO.'S PATENT PAINT having an affinity for Stucco, binds itself with it, stopping the suction, thereby rendering the wall proof against weather, and in the finish producing a pure stone-like effect, producible by no other Paint whatever. It is cheap in its application,—and may be used by any Painter, in any climate, even in the most exposed Marine situations.

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From these opinions, the conclusion is of course irresistible, that the narrow gauge is on the whole to be preferred, and that its uniformity is to be imperative, and if an alteration is to be made, it should be from the broad to the narrow. This conclusion is greatly strengthened by the fact, that there are of the former only 274 miles at present in work to 1,901 of the latter; and whilst the whole cost of the one alteration, including every possible expense, would not much exceed a million of money, the capital required for the other would be incalculably greater. To adapt the broad lines to the narrow gauge would be nothing more than to approximate the rails; but to convert the narrow into the broad would be to build new bridges and new tunnels, and, in short, to reconstruct the entire road.

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Mr. Robert Stephenson has laid before the directors of the Chester and Holyhead line, a report upon the practicability of erecting a railway communication over the Menai Straits. It appears, that he has availed himself of the assistance of Mr. Fairburn and Mr. Hodgkinson; the former so well known for his thorough practical knowledge in such matters, and the latter distinguished as the first scientific authority in the strength of iron beams. The result is a conviction that a *rectangular tube*, 450 feet long, supported on stone pillars at both ends, will prove the safest and most economical structure to meet the difficulty.——The works of the new tunnel, which is to extend from just above the Edge-hill station to the north end of Liverpool, are in progress, and will be completed with all possible dispatch.——The Post Office has accepted the offer of the Brighton company to carry a bag of letters by every train *gratis*. The South-Eastern has followed the example thus set, and doubtless will meet with a similar result.——Mr. Locke, in his report to the directors of the Richmond line, states that the viaduct across the Wandle is more than half built, and more than one-half of the excavation of the entire line has been removed. Several over-bridges between Putney and Barnes Common have been built, and the lighter earthwork and bridges are proceeding as rapidly as is needful. The only part not begun is at the Richmond end, but here the line will be formed nearly on the surface of the ground, and a few months will suffice for completing it after possession of the land is obtained. The line may be completed by June next.——The directors of the Newcastle and North Shields state, that since the opening of their new line, 5,289,000 passengers have travelled on it without receiving a single accident.——For a long time past, apprehensions have existed as to the security of the viaduct on the line of railway from Chippenham towards Corsham, and several workmen have lately been employed in propping and repairing the supports of the embankment near the station, in the hope of preventing any mishap. On Saturday last repeated creakings were heard throughout the day, and about seven o'clock in the evening the wing wall and part of the embankment under the up-line gave way with a loud crash. Fortunately, no personal accident occurred. Another slip has also occurred near Wootton Bassett, but it was much less considerable than that near Chippenham.——A few days since, the chairman of the Colchester, Stour Valley, Sudbury, and Halstead Railway committee, referring to the non-attendance of two witnesses who had been summoned to give evidence, but whose employer, a Mr. Sarjent, would not allow them to appear, said that in the event of their not presenting themselves the following day, the Speaker's warrant would be issued against them all. This threat, which involves very heavy fines and imprisonment, had the desired effect.——A serious and savage affray has recently taken place between the English and Irish labourers employed on the Lancaster and Carlisle line. It is well known, that such outbreaks can be prevented by the contractor or his subordinates; such being the case, the greatest surprise and dissatisfaction has been felt at the neglect evinced on this occasion.

ART-SAYINGS—AFTER GOETHE.

What is art-work? You look at it—you gaze, observe, examine! Criticism may arise; but you soon find *yourself* in fault—not the artist. One beauty—one harmony starts after the other; beauty *is* harmony. You view the work from a hundred sides, from a hundred views, you combine these different radii—*they* all combine, unite, centre in one focus, one thought, one mind-thought. Wherever and however you probe, analyse, scrutinise—the artist has done all the same before you—for you. There is no getting at him—behind him; the best you find, after all, is to follow after him.

What is "not" Art-work?—What *would* be something—and, in reality, is nothing, absolutely no-thing. You look at it! At every point and corner it offends you, pinches you, disheartens you. You endeavour to lay some plan, some harmony in *any* part of it. It will not do—nothing will ever tally with any thing; every thing contradicts itself and every thing around. If, in the former case, the idea seems to have sprung from heavenly brains—all perfection all unity; it is here, as if some *infernal* power had *toiled* and *toiled* hard; still, to no purpose. It is a work of toil, and pain, and deceit and conceit—but the divine is not in it.—*Genius nascitur—tandem fit.*

DUTY OF A MASTER TO HIS APPRENTICES.

On the 16th instant, an action was brought in the Court of Common Pleas, by the trustees of Marsh, who is the apprentice of the defendant Emmerton, for the breach of covenant in his indenture of apprenticeship, in not teaching him his trade as bricklayer and builder. It appeared that he had paid a premium of 25*l.* and that after being three years and a half at his trade he was quite ignorant of its more advanced arts and mysteries, whereupon his trustees demanded that he should either be properly taught, or that his premium should be refunded. This latter demand was refused, and the present action was therefore brought. Evidence was gone into to shew the ignorance of the boy in different branches of his trade. On the other side witnesses were called to shew, that he had every fair opportunity of learning his trade given to him, and that his ignorance of it was to be attributed to his own neglect and fault.

The jury found a verdict for the defendant.

Correspondence.

WESTMINSTER ABBEY—CONTEMPLATED IMPROVEMENTS.

Sir,—There is a passage in your correspondent's letter, signed □ (p. 47), relative to the proposed alterations, which I think requires notice. It is the one in which he applies the term beautiful to those outrageous abortions, the oak screens inclosing this beautiful choir.

As they are to be removed, I trust the dean and chapter will not allow them to be refixed, to detract any longer from the grandeur of one of the finest interiors we possess.

I am, Sir, &c. Samuel Field.

Beaufort-buildings.

Glass Saloon.—The Manchester Botanical and Horticultural Society propose to erect a new saloon in the gardens of Old Trafford, of sufficient size to receive the usual exhibition of flowers, plants, and fruit, and all the promenaders, and to be also available for lectures on botany, vegetable physiology, vegetable chemistry, &c. It is to be 150 feet by 45 feet; and 22 feet in height to the centre of the dome, or 32 feet to the centre of the dome ventilator. The whole of the front of this saloon is to be made of glass, and moveable, so that it may be removed in bright, hot weather. In short, the new saloon will have a back wall and two end walls, while the other side, and the whole of the domed roof will be of glass, covering an iron framework. Possessing an area of 6,750 square feet, or about 740 square yards, it will accommodate nearly 2,000 persons.—*Manchester Guardian.*

The new Wet-dock at Troon, Ayrshire, was opened for the admission of vessels last week.

Miscellanea.

Formation of Portland Vase.—At a meeting of the Society of Arts on 18th February, the discussion on the Portland Vase was resumed. Mr. Doubleday, of the British Museum, who has repaired the Portland Vase, exhibited a number of specimens of ancient glass manufactures as illustrative of the theory which he deduces as the true principle of its construction. He imagines the blue body of the vase to have been first made, and then covered with a thin coating of semi-transparent white glass, by dipping it into that material while in a state of fusion. The vase, he supposes, was next placed in the hands of the artist, who by a process similar to cameo cutting or gem engraving, produced the beautiful designs in relief which now adorn its surface. He also stated in confirmation of his idea of the mode in which the vase was constructed, that while engaged in repairing it, he observed that there existed a coat of white glass underneath the handles, at the points at which they are united to the vase. Mr. Pellatt and Mr. Christie, who were present, and who are practically acquainted with the manufacture and working of glass, addressed the meeting, and quite concurred with Mr. Doubleday in the view he had taken of its construction; but from their statements it would appear, that after all, the great merit of the work rests with the artist, as there is no difficulty at the present day, in manufacturing similar materials. Mr. Doubleday stated, that the bottom of the vase did not originally belong to it, and from the style in which it is executed, he should consider that there is a difference of 200 years in the date of their execution.

St. Mary-le bone Bank for Savings.—The sixteenth annual general meeting of this institution was held on Thursday, the 12th of this month, at the office No. 76, Welbeck-street, Cavendish-square. The Rev. J. H. Spry, D.D., in the chair. It appeared from the several reports read to the meeting, that the progress of this bank continues to be of a very favourable description, no less than 2,418 new deposits having been made in the last year, 16,201 deposit accounts remained open on the 20th November last, of which no less than 10,628 held balances averaging less than 4*l.* 7*s.* each. Upwards of 356,954*l.* was then invested with the commissioners for the reduction of the national debt. The continued evidence thus afforded of the strong and growing disposition of the working classes to provide against the casualties of life, will prove a source of gratification to all reflecting minds; and it may indeed be hoped that this provident disposition has its influence in improving the character and conduct, this class of workmen being the last to be discharged whenever establishments are reduced from scarcity of work.

Lord Northampton's Soirees to the Royal Society.—The first for the present session, held on Saturday evening last, was one of the most brilliant meetings that can be imagined. Men of all ranks and parties,—statesmen, philosophers, men of letters, and artists, thronged the rooms, and formed such an assemblage as is seldom seen. Prince Albert arrived soon after ten o'clock, and remained until half-past eleven. Parsey's compressed air-engine, some magnificent specimens of "coated glass" of British manufacture, specimens of carving by machinery (two modes),and a nice model of the Temple of Jupiter Olympus, were amongst the most noticable matters exhibited. To give a list of the men of mark who were there, would fill several of our columns.

New Houses of Parliament, &c.—On the motion of Sir R. H. Inglis, a select committee of the House of Commons has been appointed to consider "the present state of Westminster-bridge and of the new palace at Westminster, particularly with reference to the reception and accommodation of this House in the same."

New Churches. — At a meeting of the Incorporated Society for Promoting the Enlarging, Building, and Repairing of Churches, held last week, grants were voted in aid of the erection of new churches at Westleigh, near Manchester; Macclesfield Common, Northend, near Penrith; and Walcombe, near Bath; also for enlarging churches at Stort, near Devizes; Bicford, near Driffield; and St. Edwin's, near Haverfordwest.

NOTICES OF CONTRACTS.

[We are compelled by the interference of the Stamp Office to omit the names of the parties to whom tenders, &c., are to be addressed. For the convenience of our readers, however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent-garden.]

For the execution of three contracts on the South Wales Railway, being a distance of about 14 miles.

For removing a large quantity of Brick Earth from the neighbourhood of Euston-square.

For building a sewer in George-street, Harwood-street, Hampstead-road, to the extent of 422 feet, and another in Upper Southampton-street, Pentonville, for a length of 180 feet, for the Holborn and Finsbury Commissioners of Sewers.

For supplying Her Majesty's several Dock-yards with Riga fir timber, Dantzic deck deals, fir timber, and Norway spars.

For supplying the Ipswich and Bury St. Edmund's Railway with coal, goods, and ox waggons, passengers, luggage-vans, &c.

For erecting the new market, butchers' shops, &c., and pulling down some old buildings, in the borough of Dorchester.

For the supplying, erecting, and working (ten hours daily) a portable steam-engine and boiler for the Southampton sewerage commissioners.

For building the foundations of a tower and nave of Kentish rag stone for the directors of the Victoria-park cemetery.

For the execution of two portions of the Edinburgh and Northern Railway, being of the respective lengths of 3 and 5 miles.

For the execution of works on the Leeds, Dewsbury, and Manchester Railway, being a length of about 3½ miles,

For the execution of works on the Dundee and Perth Railway.

For works to be done in making additions to the Rectory House, in the parish of All Saints, Poplar.

COMPETITIONS.

The Building Committee of the Walworth Literary Institution are desirous of obtaining plans and elevations for a building suited to the purposes of the society.

The Directors of the Hull General Cemetery Company are ready to receive designs for laying out and ornamenting their grounds, and for a suitable chapel, entrance lodge, &c. A premium of twenty guineas is offered for the design most approved of, and another of ten guineas for the next best.

APPROACHING SALES OF WOOD, &c.

BY AUCTION.

In Twickenham Park, near Richmond Bridge: 137 prime oak, elm, ash, lime, fir, chestnut, and other trees.

At the Beaufort Arms Inn, Monmouth: 51 oak timber trees, of superior quality.

At the Fleur-de-Lis Inn, Lowsonford, near Warwick: 68 capital oak, elm, ash, alder, fir, and pear trees, mostly of superior growth and large dimensions.

At the Plymouth Arms Hotel, Tardebigg: 540 superior oak timber trees.

At the Cock Inn, Monks Kirby, near Rugby: 79 oak, 129 ash, 55 elm, 8 fir, and 1 beech trees, of long lengths, large dimensions, and very excellent quality.

At the White Horse Inn, Romsey, Hants: upwards of 3,000 superior oak timber trees, chiefly from 15 to 60 feet metings.

On the North Lodge Estate, Enfield, Middlesex: 780 oak timber trees, felled last spring.

At Walroad's-park Farm-house, Isle Bremers, Somerset: 198 prime elm, 52 oak, and 3 ash timber trees.

TO CORRESPONDENTS.

"C. J."—*We doubt if the custom alluded to is binding in law, but a tenant from year to year is liable for all dilapidations arising from negligence, avoidable accident, or wilful damage.*

"G."—*Our own opinion of Bath stone is not sufficiently favourable to allow the insertion of his letter. Any remarks on points to be attended to in the selection of the stone would receive consideration.*

"Practical Man."—*Bernan's work on Warming, &c., is the most comprehensive. Bell, Fleet-street, is the publisher.*

"G. A. C." *will find title-page and index to third volume in first number for present year.*

"T. L."—*Either Laxton's, Crosby's, or Skyring's price book may be obtained through any bookseller.*

"Gradients."—*A correspondent wishes to know what is the greatest rise that can be given to a railway for locomotive engines, and what for atmospheric.*

"Depretor."—*A correspondent asks which is the best way to do "depretor," that is, plastering done to represent* tooled *stone; it is the* marking *of the plastering that I am at a loss for. Is there any particular tool used?*

"B. N."—*The architect is the proper person to be applied to.*

"J. B." Ollerton.—*The second volume of* THE BUILDER *can be had complete of the Publisher: the first volume can also be had, minus a few numbers, and these may probably be obtained by advertising for them.*

"J. A. P."—*Thanks: he shall hear from us.*

"W. J." (Llanidloes).—*The application of soap and alum to exclude moisture from external walls was first proposed by Mr. Sylvester. Mr. Ferrey tested it, and found it successful. We should be disposed to try it in the present case.*

"Constant Subscriber."—*We decline recommending.*

"R. D."—*Messrs Manby, the engineers.*

"E. J. P."—*Our arrangements will not allow us to comply at this moment.*

Received.—"Carbon," "J. K.," "W. Ford," "Mr. Spencer," "W. H. J. T."

ADVERTISEMENTS.

MESSRS. BECKWITH AND CO.'S MARCH LIST OF INVESTMENTS. The attention of Proprietors of House and Landed Property wishing to sell is invited to the advantage of having them inserted in the March list about to be published. This forms a means of giving publicity to the nature of the investment without making public the exact whereabouts of the property, so that all undue notoriety is avoided.

The list within a few days of its publication will be in the hands of at least 500 genuine buyers, giving a facility for sale by private treaty altogether unprecedented. No charge whatever is made until a sale is effected. BECKWITH AND CO., Estate Agents, 25, Bucklesbury.

TO BUILDERS, PLUMBERS, ENGINEERS, AND IRONMONGERS.

BEST PAN WATER-CLOSETS, with round Valve, complete, 30s. each.

Plumbers' Bib, Ball, and Stop Cocks, ½ in., 20s.; ¾ in., 28s.; 1 in., 56s. per doz.

Lifting Force Pumps on Planks, 2½ in., 4l.; 3 in., 4l. 15s.

Washing Coppers, 1s. 1d. per pound.

Water Balls, ½ in., 15s. per doz.

Gun Metal Steam Cocks, Safety Valves, &c., and every description of Brass and Copper Work equally low, at A. McGLASHAN and Co. Brassfounders and Coppersmiths, 16, Long-acre.—N.B. Every article warranted.

HERRING'S PATENT SELF-ACTING WINDOW SASH. This important invention was exhibited before the whole body of British Architects, at the Royal Institute, Grosvenor-street, Bond-street, 23rd Feb., 1846, Wm. Tite, Esq., in the chair; after a most searching investigation as to its real merits, it was universally approved and recommended for general adoption, effectually to prevent those dreadful accidents and loss of life so frequent in cleaning windows. Builders and others in the Country will have a full-sized window (not Glazed) forwarded on receiving an order and reference, and taken back if returned free within eight days. It is a mere trifle for extra labour in applying this patent to a new window or to those now in use. The sashes are instantly taken out for all purposes without disturbing the beads, and as easily replaced by the meanest capacity. Looking at the great evils this will obviate, and the many advantages to be gained, no respectable family should be without it. To be seen daily from 12 to 3, and Licences granted by the Patentee, 14, Kingsgate-street, London. It was remarked, that Builders would be considered nothing less than insane to put in windows upon the old plan, and that no family would risk the lives of th ir servants and workmen when a preventative can be had at a trivial expense.

CALIGRAPHIC BLACK LEAD PENCIL.
Manufactured by E. WOLFF and SON, 23, Church-street, Spitalfields, London.

THE CALIGRAPHIC PENCILS have been invented by E. WOLFF and SON, after the expenditure of much time and labour. They are the result of many experiments; and every effort that ingenuity and experience could suggest has been made to ensure the highest degree of excellence, and the profession may rely upon their being all that can be desired. They are perfectly free from grit; and for richness of tone, depth of colour, delicacy of tint, and evenness of texture, they are not to be equalled by the best Cumberland Lead that can be obtained at the present time, and are infinitely superior to every other description of pencil now in use.

The Caligraphic Pencils will also recommend themselves to all who use the Black Lead Pencil as an instrument of professional importance or recreation, by their being little more than half the price of other pencils—

H, HH, HHH, HB, B, BB, F, FF, W*	4s. per doz.
BBB, EHB	8s. ,,
BBBB	12s. ,,

* This pencil is particularly recommended for writing and counting-house use.

An Allowance on every Gross purchased by Artists or Teachers.

May be had of all Artists' Colourmen, Stationers, Booksellers, &c.

A single Pencil will be forwarded as a sample, upon the receipt of postage stamps to the amount.

CAUTION.—To prevent imposition a highly finished and embossed protection wrapper, difficult of imitation, is put round each dozen of Pencils. Each Pencil will be stamped on both sides, "Caligraphic Black Lead, E. Wolff and Son, London."

*** The usual trade allowance to stationers, booksellers, &c. A Show Box Gratis with an order for a gross of Pencils.

ATKINSON'S CEMENT.—The public is respectfully informed, that the price of this very excellent Cement, which has now been in use for Architectural and Engineering works upwards of thirty years, is reduced to 2s. 3d. per bushel, and may be had in any quantity at Wyatt, Parker, and Co.'s Wharf, Holland-street, Surrey side of Blackfriars-bridge.

N.B.—This Cement being of a light colour, requires no artificial colouring or painting, and may be used for stucco with three parts its own quantity of sand.

PORTLAND CEMENT, which does not vegetate, and requires no colouring, is perfectly hydraulic, and resists the action of Frost. The cost of the material and of working it is about the same as Atkinson's Cement, Manufactured by J. B. WHITE and SONS, Millbank-street, Westminster, and sold at their Warehouses:—
Druce's Wharf, Chelsea,
Bell's Wharf, Paddington,
Earl-street, Blackfriars,
Albion Wharf, Deptford-bridge,
by Salmon and Co., Dublin,
and at 36, Seel-street, Liverpool.

ROMAN CEMENT, &c.
REMOVAL.
THOMAS JOHN CROGGON
Begs to inform the Trade that he has removed to
8, LAWRENCE POUNTNEY-HILL and
THREE CRANES WHARF, 69, Upper Thames-street.
Orders addressed to either place for ROMAN CEMENT of genuine quality will be executed with promptitude and the strictest regard to quality and economy.

KEENE'S PATENT MARBLE CEMENT.

WITHOUT noticing CAUTIONS, which are as absurd as they are uncalled for, or disproving assertions, which carry with them their own refutation, the patentees of KEENE'S CEMENT venture to believe, that this material will very advantageously stand the test of comparison with any cement of a similar nature, however INVALUABLE, now before the public. They derive this opinion from its all but exclusive use in the new buildings north of Hyde-park, on the Brompton estate, and in many other public and private edifices, both in London and the country. Amongst others may be mentioned the works recently executed at the Colosseum, Regent's-park, where its hardness and beauty of appearance have caused it to be extensively used for skirting and other mouldings, in place of wood, for columns instead of marble, and as a substitute for stone in paving the floors of the corridors and conservatories.

Patentees and manufacturers, J. B. WHITE & SONS, Millbank-street, Westminster,

MARTIN'S FIRE-PROOF AND ORNAMENTAL CEMENT.

CAUTION.—Messrs. STEVENS and SON, Patentees, beg to caution their friends and the trade generally against confounding this invaluable Cement with others, erroneously said to be of the same description. S. and S. pledge themselves, that MARTIN'S CEMENT is totally dissimilar in composition and manufacture from every other, and, being a neutral compound, is not only free from chemical agency upon any substance with which it may come in contact, but completely resists the action of the strongest acids. They feel it a duty to direct attention to the following properties, which it exclusively possesses:—

1. It rapidly acquires the hardness of stone.
2. Unlike other internal cements, its hardness is uniform throughout its entire thickness.
3. Its surface (which may be made equal to that of the finest marble) NEVER THROWS OUT ANY SALT, and will receive paint in four days, without peeling, when put upon dry work.

It is peculiarly adapted as an internal stucco for walls, skirtings, architraves, mouldings, and enrichments of all kinds, to all of which purposes it has been extensively applied by Mr. Thomas Cubitt on the Grosvenor estate, &c.

For the above purposes, it possesses great advantages over wood, being more economical and durable, resisting fire, damp, and vermin.

For the floors of hall and fire-proof warehouses, its lightness, durability, and uniform surface give it an immense advantage over stone, being, at the same time, much more economical. The most satisfactory references can be given. To be had of the Patentees, Plaster of Paris and Cement Manufacturers, 186, DRURY LANE.

Agent for Liverpool and Manchester, Mr. R. PART, 28, Canning-place, Liverpool.

TO ARCHITECTS, ENGINEERS, CONTRACTORS, BUILDERS, MASONS, AND PLASTERERS, MERCHANTS, SHIPPERS, AND THE PUBLIC IN GENERAL.

JOHNS and CO.'S PATENT STUCCO CEMENT.—The following are the positive advantages possessed by this Invention over every Cement hitherto introduced:—It will effectually resist Damp. It will never vegetate nor turn green, nor otherwise discolour. It will never crack, blister, nor peel off. It will form a complete Stone casing to any Building covered with it. It so closely resembles Stone that it is impossible to detect it. It never requires either to be painted or coloured. It will keep fresh and good in the cask in any Climate for any number of years. It is the only Cement that can be depended upon for export. It is the only Cement that can be used with confidence by the Sea-side. It may be used in the hottest or coldest Climates at any season. It will adhere to any substance, even to Wood, Iron, or Glass. It will carry a larger Proportion of Sand than any other Cement. It matures by age, and becomes perfect when other Cements begin to perish. It may be worked through the Winter, as frost has no effect upon it. It may be used on the Inner Walls of new Houses, which may be papered over or painted directly. Roofs laid or pointed with this Cement will remain undamaged by the severest Storms. Any Plasterer may apply it, the Instructions for use being very clear and distinct. The first cost of this material does not exceed that of the cheapest Cement now in use; but with all the above-named extraordinary and valuable advantages, nothing can approach it in point of economy.

Architects and Builders who have used this Cement have declared that it requires only to be known, to be universally preferred.

Specimens may be seen, and a Prospectus fully describing the Cement and its mode of application, together with a volume of Testimonials from every part of the Kingdom, may be obtained on application at the office of "The Builder," and of MANN and CO., SOLE AGENTS for the Patentees, 5, Maiden-lane, Queen-street, Cheapside, London: of whom also may be had,

JOHNS and CO.'S PATENT STONE-COLOUR STUCCO PAINT, expressly intended for Painting over exterior Walls of Houses that have been covered with Roman or other Cements, and which have become dirty and discoloured. It is in every way better suited for this purpose than White Lead Paint, which will frequently come off in flakes, being in direct chemical opposition with Cement; whereas MESSRS. JOHNS and CO.'S PATENT PAINT having an affinity for Stucco, binds itself with it, stopping the suction, thereby rendering the wall proof against weather, and in the finish producing a pure stone-like effect, producible by no other Paint whatever. It is cheap in its application,—and may be used by any Painter, in any climate, even in the most exposed Marine situations.

PREPARED FLOORING BOARDS.

AT REDUCED PRICES.

ALWAYS ON SALE, a LARGE ASSORTMENT of DRY PREPARED FLOORING BOARDS and MATCHED BOARDING of all sorts, planed to a parallel width and thickness, from ¾ inch to 1¼ inch thick. Rough Boarding for Flats.

TIMBER, DEALS, OAK PLANKS, SCANTLINGS, SASH SILLS, &c.

Apply at W. CLEAVE'S Timber Yard, Smith-street, Westminster.

PREPARED FLOORING BOARDS.

ALWAYS ON SALE at A. ROSLING'S, SOUTHWARK-BRIDGE-WHARF, BANKSIDE, and Old-Barge-Wharf, Upper Ground-street, Blackfriars, a very large stock of well-seasoned Floor Boards of every variety.

A. R., in calling the attention of builders and consumers, confidently presumes on his being able to supply them on such advantageous terms, as will ensure and merit their favours and approbation.

MUIR'S PATENT PLANING MACHINERY.

SAW MILLS, GILLINGHAM-STREET, PIMLICO.

TIMBER of any Size, PLANK, DEALS, and BATTENS, &c. Sawn on the most approved principle. Boards, &c., Prepared, Matched, and Grooved, by Muir's Patent Machinery. The Mills have all the advantages of navigation and water-carriage, being connected with the Thames by the Grosvenor-canal. Goods fetched from the docks and carted home free of charge.

Address to HENRY SOUTHAM,
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Gillingham-street, Pimlico.

THE GENERAL WOOD CUTTING COMPANY, TIMBER and DEAL SAWING and PLANING MILLS, Belvedere-road, Lambeth, near Waterloo-bridge.—SAWING in all its branches executed with the greatest precision and despatch. PLANING by the most approved Machinery, reducing the Boards to a parallel width and thickness, and grooving or matching with undeviating accuracy. The operation economizes time, money, and material.

SIR WILLIAM BURNETT'S PATENT for the Preservation of Timber, Canvas, Cordage, Cotton, Woollen, &c., from Decay.

TESTIMONIALS.

From THOMAS GRAHAM, Esq., M.A., F.R.S., L. and E., Professor of Chemistry, University College, London.

"After making several experiments on wood prepared by the solution of chloride of zinc for the purpose of preservation, and given the subject my best consideration, I have come to the following conclusions.

"The wood appears to be fully and deeply penetrated by the metallic salt; I have found it in the centre of a large prepared paving block.

"The salt, although very soluble, does not leave the wood easily when exposed to the weather, or buried in dry or damp earth. It does not come to the surface of the wood by efflorescence, like the crystallizable salts. I have no doubt, indeed, that the greater part of the salts will remain in the wood for years, when employed for railway sleepers or such purposes. This may be of material consequence when the wood is exposed to the attacks of insects, such as the white ant in India, which I believe would be repelled by the poisonous metallic salt.

"After being long macerated in cold water, or even boiled in water, thin chips of the prepared wood retain a sensible quantity of the oxide of zinc; which I confirmed by Mr. Toplis's test, and observing that the wood can be permanently dyed from being charged with a metallic mordant.

"I have no doubt, from repeated observations made during several years, of the valuable preservative qualities of the solution of chloride of zinc, as applied in Sir. W. Burnett's process; and would refer its beneficial action chiefly to the small quantity of the metallic salt which is permanently retained by the ligneous fibre in all circumstances of exposure. The oxide of zinc appears to alter and harden the FIBRE of wood, and destroy the solubility, and prevent the tendency to decomposition of the azotised principles it contains, by entering into chemical combination with them.

(Signed) "THOMAS GRAHAM."

"University College, 25th October, 1845.

From Professors BRANDE and COOPER.

"London, 4th November, 1845.

"SIR,—We have this day again examined the specimens of canvas and wood prepared according to the specification of your patent, and which, in the month of April, 1844, we placed in a damp cellar, where they have remained up to this date.

"We are now enabled satisfactorily to corroborate the favourable opinion expressed in our former report. The canvas remains amply protected from all fungous vegetation and rottenness, while a corresponding sample of the same piece, which had not been prepared by immersion in the solution of chloride of zinc, is entirely decayed, being mouldy, rotten, black, and in places resembles timber.

"We have also lately compared the strength of a fibre of a piece of canvas which we prepared according to your specification, in October, 1844, with that of the fibre of the same canvas, unprepared, and find that it has in that respect sustained no injury. We are therefore of opinion that your process will not, after any lapse of time, tend to deteriorate the strength of the fibres of the substances in question.

"In regard to the several samples of different species of wood above adverted to, each of which was cut into two, one half being imbued according to the directions of your specification with the dilute solution of chloride of zinc, while the other half was left in its original condition, we have also to make a favourable report, and to repeat our opinion of the efficacy of your process as a preventive of dry rot, and similar sources of decay; the unprepared specimens are manifesting symptoms of decay and mildew, while those which have been protected by your preparation are clean and sound.—(Signed) "WILLIAM THOMAS BRANDE,
"JOHN THOMAS COOPER."

"To Sir William Burnett, K.C.H., F.R.S., &c. &c."

Testimonials from numerous other parties may be obtained on application, personally or by letter, to the Secretary, and Specimens may be seen at the Office, 53, King William-street, London-bridge.

DRUCE'S No. 2, WHARF, late Paradise-wharf, Chelsea.

TO THE TRADE.—Parties desirous of delivering Timber Deals, Stone, Bricks, or any other goods, in the districts of Chelsea, Brompton, Fulham, Kensington, &c. &c., will find great facilities of Wharfage, Cranage, or Delivery, by applying as above.

N.B.—A weighbridge on the premises.

PAYNE'S PATENT PROCESS FOR THE PRESERVATION AND IMPROVEMENT OF TIMBER, &c.

PAYNE and LODER beg to invite the attention of Engineers, Railway Companies, Architects, and others to the above process, and to state that they are prepared to erect the necessary apparatus in any part of the United Kingdom where the quantity is sufficiently large to cover the outlay of its removal.

Further particulars can be obtained at Whitehall-Wharf Cannon-row, Westminster, or at their other stations, Fleetwood-on-Wyre, Lancashire; Wisbeach, Cambridgeshire; Union-Wharf, Southampton; and Guildford, Surrey.

SNOXELL'S PATENT SAFETY REVOLVING WOOD SHUTTERS,

Manufactory, 96, Regent-street, and 131, Chancery-lane.

THE Patentee can confidently recommend these Shutters both for security and durability. The edges being sheathed with IRON, and the cost little more than common shutters, their construction so simple, that the largest establishment can be opened or closed in a few moments with the greatest possible ease without the use of machinery. Their superiority over other Revolving Shutters consists in being made without metal hinges, consequently cannot rust, buckle, or get out of order, and are equally safe. W. SNOXELL will have much pleasure in giving reference to numerous establishments where they are fixed, having on all occasions given the greatest satisfaction.

REDUCTION IN THE PRICE OF
BUNNETT AND CORPE'S
PATENT REVOLVING IRON SHUTTERS.

THE validity of this Patent being completely established, the Patentees have much pleasure in stating that the very extensive demand, and the employment of improved machinery in the manufacture, have given them an opportunity (of which they gratefully avail themselves) of making a considerable reduction in the price of this well-known and tried invention, thereby rendering them the cheapest as well as the best iron shutters in use. Every improvement suggested by practical skill and most extensive application has been adopted, and no effective REVOLVING IRON SHUTTER can be constructed without infringing B. and C.'s patent. The worm and wheel, as patented by them, being the only safe, durable, and efficient mode of raising and lowering such shutters, these shutters can be applied horizontally, either above or below the window, or vertically, as introduced by BUNNETT and CORPE, in some of the largest establishments: they are made with bent or corrugated laths, if required.

BUNNETT and CORPE also manufacture

REVOLVING WOOD SHUTTERS,

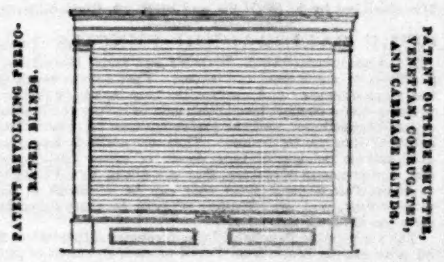
with their patent raising machinery, or with counterbalance weights, and with proper metallic hinges, without which no shutters can be safe or durable.

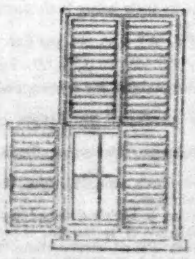
BUNNETT and CORPE are likewise Patentees and Manufacturers of METALLIC SASH-BARS, MOULDINGS, &c., IN BRASS, COPPER, OR ZINC, FOR SHOP FRONTS, WINDOWS, SKYLIGHTS, AND VARIOUS OTHER PURPOSES.

Shop Fronts fitted in a superior manner with Iron Shutters, Patent Brass or Zinc Sashes, Moulded Engraved Stall Board Plates, best Plate Glass, and internal Brass Fittings of all kinds, on the most advantageous terms. Estimates given and contracts taken in Town or Country.—All kinds of metal works executed to any design. Metal Drawing, Rolling, and Stamping for the Trade. OFFICE, 26, LOMBARD-STREET, LONDON. WORKS, at DEPTFORD, KENT.

IMPROVED PATENT CONVEX IRON REVOLVING SAFETY SHUTTERS.

PATENT SAFETY IRON SLIDING SHUTTERS.





The attention of Architects, Builders, Blind Makers, and the Trade generally, is particularly requested to the IMPORTANT patented IMPROVEMENTS in the above enumerated Articles, and inspection invited, at the Manufactory of the Patentees, R. HOWARD and Co., 115, Old Street, London; or at the Licensees.

Engravings and Prospectuses may be had at the above address, or will be forwarded on application.

The great importance of STRENGTH and STIFFNESS in the Laths of REVOLVING IRON SHUTTERS, when required for SECURITY, is so obvious, that it is only necessary to point out the fact that the PATENT CONVEX LATHS ARE 12 TIMES STRONGER THAN THE ORDINARY FLAT LATHS (as shewn by the engravings and prospectus), to ensure their general adoption.

REVOLVING IRON SHUTTERS MADE OF THE COMMON FLAT LATHS, AT A VERY CONSIDERABLE REDUCTION OF PRICE.

CAUTION.—The Patentees beg to caution all persons against Making or Using BENT LATHS for REVOLVING IRON SAFETY SHUTTERS, so as to obtain increased strength or stiffness; as they thereby render themselves liable to legal proceedings for infringing this patent.

Licenses Granted.

HEATING by WARM WATER.—An improved method of HEATING by the CIRCULATION of HOT WATER may be seen in operation daily at J. L. BENHAM and SONS, Stove Grate Manufactory, 19, Wigmore-street, Cavendish-square. Estimates given for warming churches and other public or private buildings in town or country. A great variety of warm-air stoves of every description, from fifteen shillings to twenty pounds.—19, Wigmore-street, Cavendish-square.

HOT WATER APPARATUS.—The attention of architects, builders, and others is respectfully requested to BENJAMIN FOWLER'S superior method of heating churches and chapels, halls, staircases, conservatories, forcing and greenhouses, manufactories, and warehouses, kilns, rooms for drying timber, &c., and every variety of purpose for which artificial heat is required. Within the last twenty years some hundreds of buildings have been heated upon this plan, and the parties for whom they were executed are constantly expressing their satisfaction, also their willingness to vouch for their efficiency. An improved wrought-iron boiler, which requires no brickwork, may be seen in action upon the premises. BENJAMIN FOWLER, 63, Dorset-street, Fleet-street.

MR. ALLEN, Patentee and Manufacturer of the SELF-ACTING WORM STOVE, begs to inform scientific persons and the public generally, that having received the most gratifying encomiums on his invention, has now a variety ready for inspection, and he feels confident from their efficiency of action for all requisite purposes where heat and ventilation becomes a desideratum, they will recommend themselves to public patronage. It may be proper to observe, that the principles of the Worm Stove facilitates the method of heating by steam or hot water.—21 and 22, Worship-street, Finsbury.

R. HENLY & Co., WHOLESALE IRONMONGERS, and MANUFACTURERS of KITCHEN-RANGES, STOVES, &c., 196, Blackfriars-road, and 117, Union-street, Borough.

Strong Self-acting Kitchen-Ranges, with back Boiler and Oven, and Wrought Bars:—

3 ft.	3 ft. 3 in.	3 ft. 6 in.	3 ft. 9 in.	4 ft.
3l. 6s.	3l. 13s.	3l. 16s.	4l.	4l. 10s.

Henly's Patent Improved, with back Boiler and Wrought Iron Oven:—

3 ft.	3 ft. 3 in.	3 ft. 6 in.	3 ft. 9 in.	4 ft.
5l.	5l. 15s.	6l. 5s.	6l. 10s.	7l.

Best Register Stoves, at 7d., 8d., and 9d. per inch.

Do. Elliptic do., at 3½d., and 4d. do.

Manufacturer of WOLFASTON'S PATENT REGISTER STOVES, a certain cure for SMOKY CHIMNEYS, and effecting a great saving in fuel. To be seen in use daily.

Orders from the Country, accompanied with a remittance or reference, will meet with prompt attention.

RAIN WATER PIPES, Heads, Shoes, and Elbows, Half-round and O G Gutters, Sash Weights, Railing Bars, Sink and Stable Traps and Gratings, Air Bricks, Coal Plates, &c.; Gas and Water Pipes from 1½ in. to 12 in. in diameter, with Bends, Branches, Syphons, and Lamp Columns; also Hot-water Pipes, with all the usual connections. A large Stock of the above Castings at JONES'S Iron Bridge Wharf, and No. 6, Bankside, Southwark.

MESSRS. NEILSON AND MITCHELL

BEG to inform Builders that they have always on hand, at their premises, 15, Wharf-road, City-road,

A LARGE ASSORTMENT OF R. W. PIPES, GUTTERING, SASH-WEIGHTS, &c.,

which they are disposing of at very low prices. Castings of every description done to order.—BALLUSTERS.

ENCAUSTIC, VENETIAN, and other PATENT TILES and MOSAIC PAVEMENTS may be purchased at MINTON and Co.'s warehouse, 9, Albion-place, Surrey side of Blackfriars-bridge.—Wyatt, Parker, and Co., Agents. The above tiles have lately been considerably reduced in price.

N.B. An assortment of plain and ornamental door furniture, slabs, and tiles for fire-places, &c.

HIP TILES to suit slate roofs in colour; Ridges, with plain or rebated joints, roll tops, and vertical ornaments; drains, many sizes, with plain or socket joints; paving in squares, hexagons, octagons, &c., different colours; roofing, in Grecian or Italian styles, other devices also, or plain; conduits, which do not injure pure water; fire-bricks and tiles; clinkers, and out-door paving; sundry wall-coping, garden-borders, chimney-tops; also tubular and other flues of peculiar material. No agent, but a depôt at 22, WHITEFRIARS-STREET, FLEET-STREET, LONDON, under Mr. PEAKE'S personal care, to supply genuine TERRO-METALLIC goods at fair prices as per quality; also, additional Stock at No. 4 Wharf, Macclesfield-street, South, City Basin.

The TILERIES, TUNSTALL, STAFFORDSHIRE, are near the centre of England, whence boats are sent direct to any inland place; or to the Mersey for the coasts, the colonies, and elsewhere.

WM. BANGHAM,
FURNISHING UNDERTAKER,

NO. 7, Stockbridge-terrace, corner of Vauxhall and Pimlico roads, begs to inform the Trade they can be supplied with every article requisite for funerals at the lowest furnishing prices, and a liberal credit if required.

For the convenience of the trade every facility is studied. LEADEN COFFINS may be obtained full trimmed in an hour, and every other article on the shortest notice. Cambric and Satin Shrouds, Winding Sheets, &c. Horses, Coaches, Feathers, Velvets, Heraldry, &c. Country orders punctually attended. No extra charge for delivering large coffins within ten miles.

BY LETTERS PATENT.

PATENT LINING FOR WALLS OF HOUSES, &c. This patent offers the only satisfactory remedy for damp, whether saline or otherwise, in walls of houses. It is also a finished surface for every method of decoration. It is employed by some of the principal building and decorative firms in London. Made to fit compartments, it can be attached by country workmen. The Patented Invisible Join of the Patent Lining applied with unrivalled effect to Velvets, Satins, &c. &c.

Specimens at the patentees, Mr. JOHN COLLARD DRAKE, 19, Elm Tree-road, St. John's-wood; or at the Office of "The Builder."